FLORIDA WILDLIFE®

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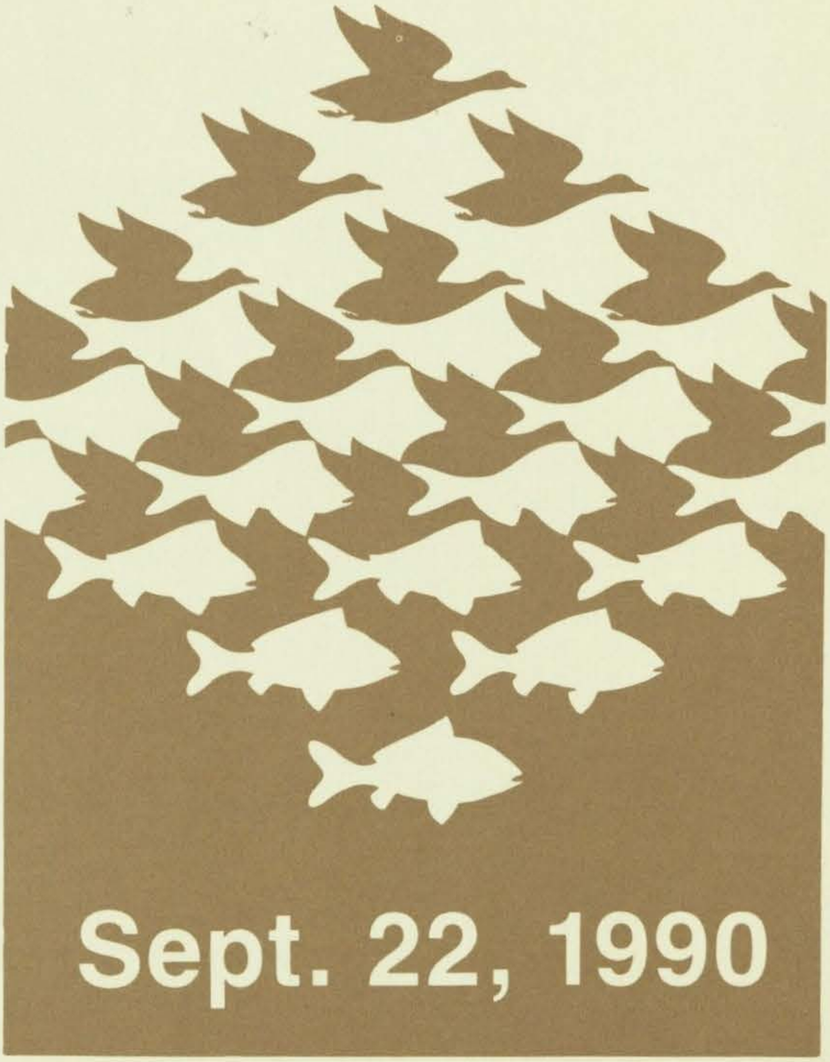
Experience the Outdoors



Sept. 22, 1990

National Hunting & Fishing Day®

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Florida Habitats

One of Florida's native wetlands, seepage bogs, is featured in the first of a series of habitat articles, page 32.

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Our Covers

One of Florida's unique floodplain habitats was photographed by James Valentine at the Aucilla River. The mourning doves on our back cover were photographed by Tom Ulrich.

FLORIDA WILDLIFE HABITAT
The Last 50 Years

By Randy Kautz

If you've lived in Florida for any time at all, you've probably found yourself spending more time sitting in traffic. Or maybe that secluded stretch of beach you liked to walk along is no longer so private because of the new condominium built in the dunes. Maybe your favorite hunting ground is now off-limits because the land was sold and turned into a residential subdivision. Or perhaps you noticed that a new convenience store was built on a wooded lot just down the street.

These examples are typical of ways Florida's landscape is changing today. The population of Florida has grown from only 1.7 million residents in 1936 to over 12 million today. That's an increase of over 600 percent in less than 50 years. Moreover, 39 million tourists come to Florida every year to enjoy our abundant natural resources. The phenomenal growth in the number of tourists and new residents shows no signs of slowing.

These new people need more than homes and motel rooms. They need roads, shopping centers, power plants, electrical lines, sewage treatment plants, office buildings, industrial parks and more. To meet these needs, vast areas of Florida's countryside have been cleared and converted to human uses. Virtually every acre of cleared land in Florida was once productive wildlife habitat.

Wildlife Needs Wildlands

Unfortunately, destruction of wildlife habitat in Florida has been so widespread and rapid that many species are running out of places to live. Most Floridians are aware of the plight of highly publicized species like the Florida panther, which has been reduced to approximately 50 individuals living in extreme south Florida. But few residents are aware that our state is home to more threatened and endangered species than any other state except California. And only a handful have ever even heard of many of these species. For example, are you familiar with the rimrock-crowned snake, the short-tailed snake, the sand skink, the least tern, the piping plover, the white-crowned pigeon or the gray bat? Even more alarming is that some formerly common bird species, such as the eastern bluebird, northern flicker, brown-headed nuthatch, loggerhead shrike and eastern meadowlark, are now known to be declining. In virtually every case, the major problem facing these species is loss of habitat to development.

When we report these facts and attribute the cause to habitat loss, there seem to be many skeptics who just don't believe what they hear. They see plenty of cardinals and mockingbirds around, and some folks are downright sick of raccoons that raid their garbage cans. Not only that, more than a few of us are keenly aware of the 6-foot alligator in the canal out back. So what's the problem?

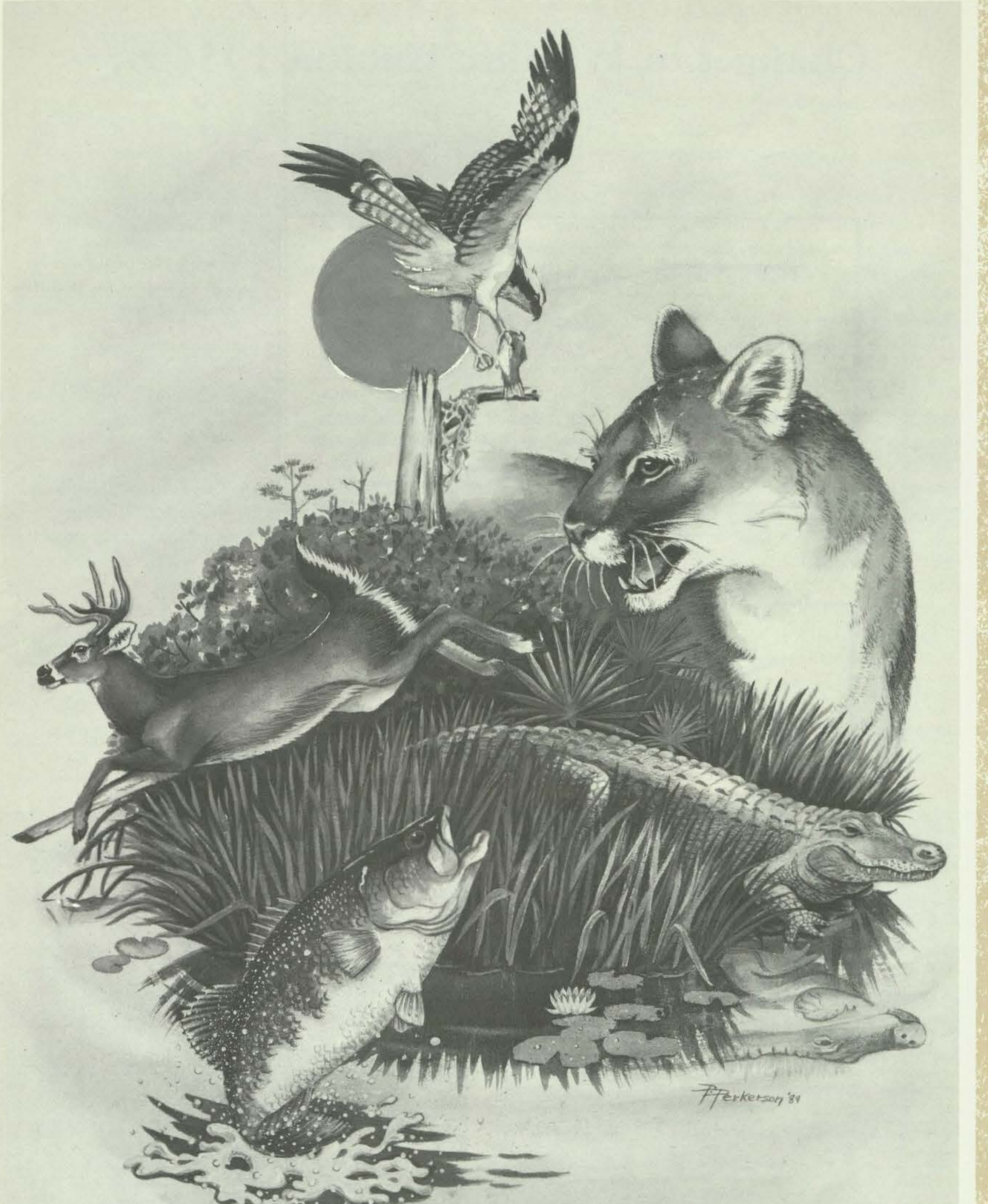
A few statistics and a couple of graphs should put into perspective just how serious habitat loss really is for wildlife. Since 1936, Florida's forested areas, including wetland forests, declined from 20.9 million acres to 16.6 million acres (see Figure 1, page 4). That's a loss of 4.3 million acres, or 21 percent of our forest lands, in 54 years. The Apalachicola National Forest in the Panhandle, which is about 500,000 acres, is Florida's largest national forest. Since 1950, Florida has lost the equivalent of *more than eight* Apalachicola National Forests.

What's the Effect on Wildlife?

Of 56 species listed by the Commission as endangered or threatened, 23 depend on forested habitats for survival. The list includes such species as the ivory-billed woodpecker, which is thought to be extinct as a result of logging of mature bottomland forests in the first half of this century. Also on the list is the Key Largo woodrat, now confined to only 2,000 acres of tropical hardwood hammock on North Key Largo. Commission nongame wildlife biologists have recently documented declines in such common forest-dwelling birds as the red-headed woodpecker and brown-headed nuthatch. Just how much more forest will be destroyed before these animals make it onto the endangered list?

Of all the forest types in Florida, none have been affected more dramatically than those dominated by longleaf pine. In 1936, longleaf pine forests accounted for 51 percent of all pinelands in Florida and 37 percent of all forests. However, in the past 50 years, longleaf pine forests have declined from 7.6 million acres to only 0.95 million acres today. At this rate, longleaf pine forests will disappear from Florida by 1995! The most frightening aspect of this loss is that mankind has reduced the most common type of forest in Florida to an endangered ecosystem in only 50 years.

Because they were once so widespread, longleaf pine forests had become home to a wide variety of wildlife. Now, the continued existence of some of those species is tightly linked to the future of longleaf pine. The threatened red-cockaded woodpecker, which lives only in mature longleaf pine forests, ▷



Unfortunately, the destruction of wildlife habitat in Florida has been so widespread and rapid that many species of wildlife are running out of places to live.

Changes in Wildlife Habitat 1936-87

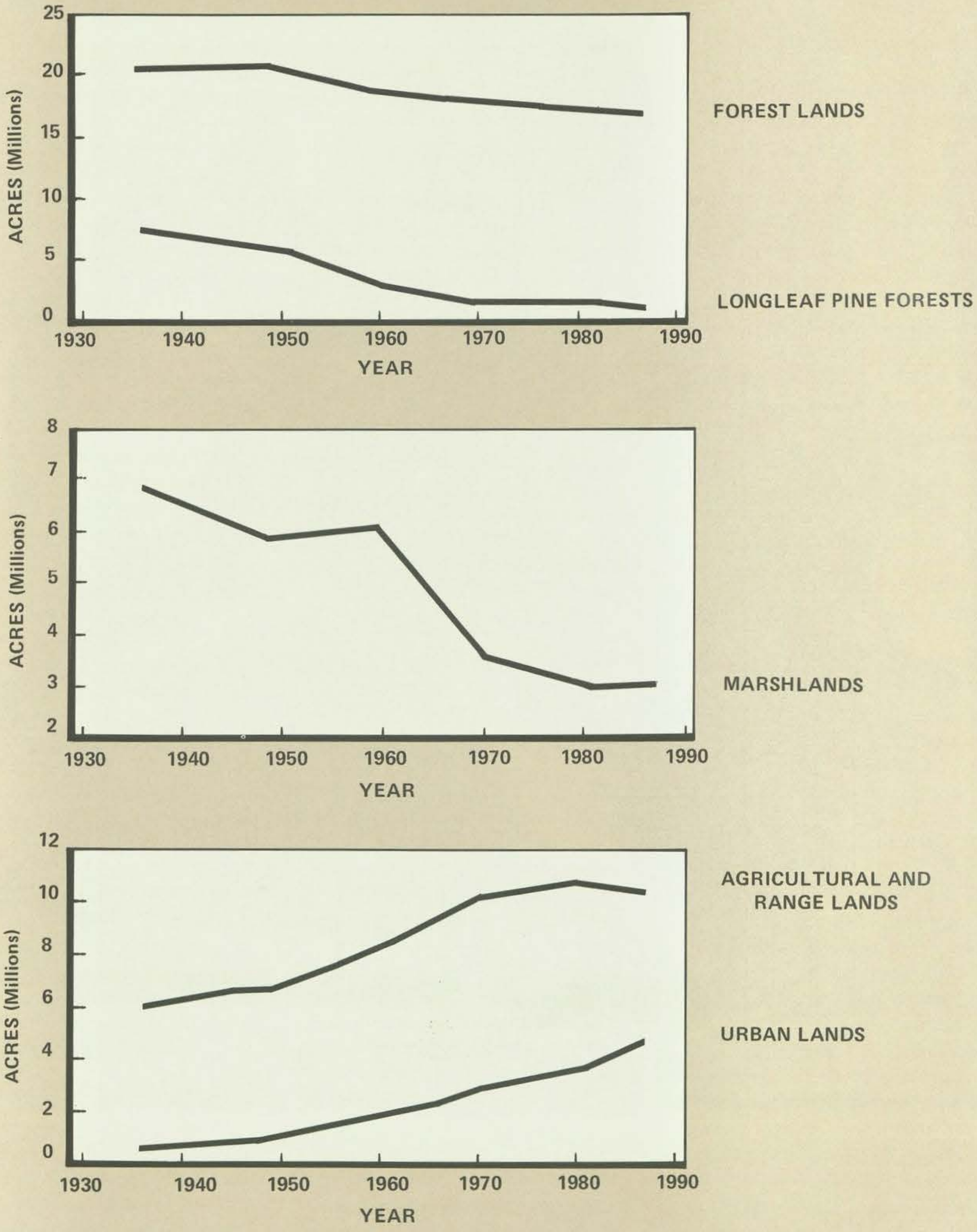


FIGURE 1.

is a pertinent example. This diminutive bird excavates nesting cavities primarily in longleaf pines over 75 years of age. Unfortunately, since most mature longleaf pines in Florida have been logged out, and since today's planted pine forests are managed on 20-60 year rotations, very little red-cockaded woodpecker habitat remains.

The gopher tortoise is another example. Gopher tortoises were so common in the Great Depression that they were known locally as "Hoover chickens" because they were an easily obtained substitute for poultry. Now it is illegal to take gopher tortoises. The Commission has listed them as a species of special concern due to habitat destruction and over-harvest.

Marshland Ecosystems

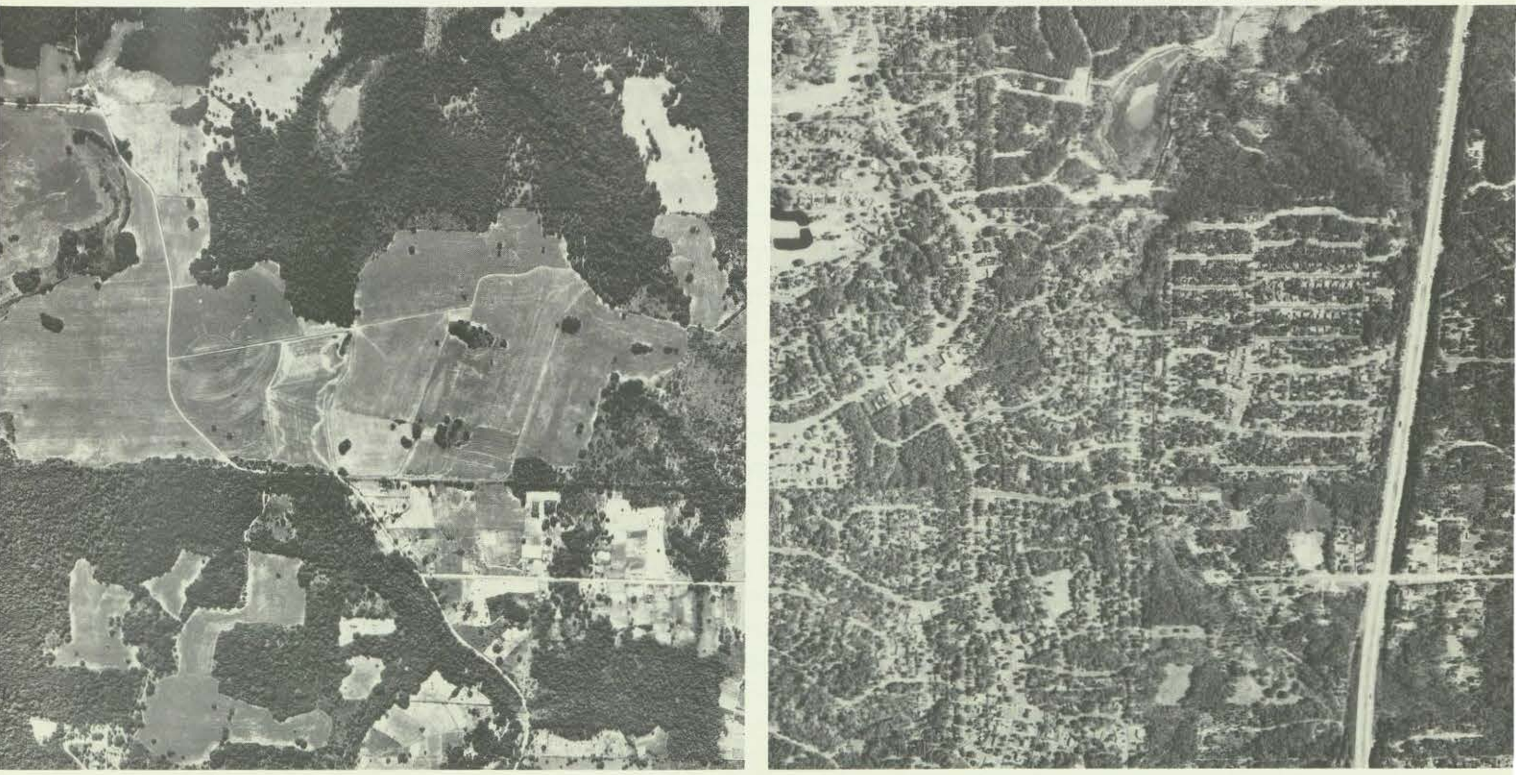
Another major wildlife habitat type seen throughout Florida is marshland. The Florida Everglades, one of the world's best-known marsh ecosystems, comprises over 1.8 million acres of South Florida. Biologists define marshes as wetlands that support herbaceous (grasses and grass-like) plants. Marshes are divided into two major types: salt marshes and freshwater marshes. In Florida, salt marshes are more common along bays and estuaries of the northern part of the state. On the other hand, freshwater marshes are more common inland from the coast in the southern two-thirds of the peninsula.

In 1936, marshlands covered 7 million acres or roughly 20 percent of Florida. However, between 1936 and 1987 marshlands declined to 3 million acres (refer to Figure 1). Developers, farmers, ranchers and water managers have drained or filled almost 60 percent of Florida's marshland. Although most marshland was lost in a piecemeal fashion, in some cases large portions of entire wetland ecosystems were destroyed for human use. Agricultural interests drained 700,000 acres of the northern Everglades to grow sugar cane and vegetables, and 200,000 acres of marsh in the upper St. Johns River basin were converted to citrus and cattle production. In addition, the U.S. Army Corps of Engineers drained 30,000 acres of marsh along the Kissimmee River for flood control, and farmers converted 16,000 acres of marsh along the northern shore of Lake Apopka to grow vegetables.

What do we need marshes for anyway? For one thing, we need them to support wildlife — alligators and egrets, herons and other wading birds — that are, in a way, the essence of Florida. The wholesale destruction of marshlands over the past 50 years has been especially tough on Florida's wading birds, particularly in the Everglades. As the Everglades were being drained, wading bird populations in the region declined as well — to the point that only 10 percent of their former numbers remain. No longer do wood storks, great egrets, great blue herons, little blue herons, tri-colored herons, snowy egrets, and white ibises fill the Everglades skies as they once did.

Florida's list of endangered and threatened species includes eight that are dependent on marsh habitats for survival: Atlantic salt marsh water snake, Cape Sable seaside sparrow, Florida sandhill crane, wood stork, snail kite, Everglades mink, silver rice rat and Lower Keys rabbit. ▷

FLORIDA DEPARTMENT OF TRANSPORTATION



Aerial views show the same Leon County area north of Tallahassee in 1962 (left) and in 1990 (right).

Unfortunately, one marsh-dependent subspecies, the dusky seaside sparrow, is now extinct. The dusky formerly inhabited marshes of the upper St. Johns River, but its habitat has been converted to agriculture. By the time conservationists realized that this species was in trouble, it was too late. In the early 1980s an effort was made to catch all remaining dusky seaside sparrows, initiate a captive breeding program and return new birds to the wild. However, biologists located and caught only six males; no females were to be found. The last known dusky seaside sparrow died in captivity in 1987.

With a loss of almost 60 percent of our marshlands in only 50 years, it's no wonder these species are so precariously close to disappearing from Florida.

What Happened to the Habitats?

Up to this point we've covered only the gross declines in forests and marshlands, two of the major wildlife habitats present in Florida. Let's explore in greater detail what has happened to these habitats. It should come as no surprise that urban lands have increased from only 0.7 million acres in 1936 to 4.6 million acres today. This is an increase of over 650 percent in only 50 years! To put this into perspective, pavement, shopping centers, houses and such now cover 13 percent of Florida's original upland and wetland wildlife habitats.

Urbanization, however, can't take all the blame for the extensive loss of wildlife habitat from Florida's landscape. By the time of the first major inventory of land uses in 1936, agricultural interests had already converted 6 million acres, or 17 percent of Florida, to the production of crops and cattle. By 1980, agricultural and range lands increased to 10.8 million acres, but between 1980 and 1987 these lands began to show a decline. In all likelihood, the recent downturn is evidence that even agricultural and range lands are falling victim to the growing conversion of the Florida landscape to urban uses.

When you add these numbers together, you find that 43 percent of Florida's original habitats are now in urban, agricultural and rangeland use. While these statistics paint a sad picture of the future of wildlife and wildlife habitat in Florida, they don't tell the whole story. For example, although there are still over 16 million acres of forest land in Florida, much of what remains is highly fragmented or has been converted to pine plantations. Many species of wildlife disappear from fragmented forests because the remaining patches are either too small to support an animal or are so far apart that an animal can't use them.

In addition, timber growers have converted hundreds of thousands of acres of our remaining natural forests into plantations of slash pine, loblolly pine and sand pine. This is particularly true in north Florida. Pine plantations are managed more like field crops than forests. As a consequence, many plant species which provide food and cover for wildlife in natural forests have been eliminated by forest management practices. Furthermore, standing dead trees, which are required by many cavity nesting species, are removed. The result is that the wildlife-habitat quality of planted pine "forests" is exceedingly low compared to pristine, unmanaged forests.

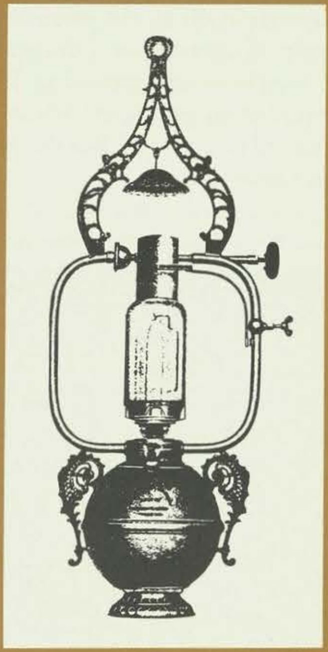
Since 1950, Florida has lost the equivalent of more than eight Apalachicola National Forests!

Similar problems plague Florida's remaining marshlands. For example, in the Everglades, water managers have constructed an extensive system of levees and canals around thousands of acres of remaining marshes, radically altering historic hydroperiods. Everglades water conservation areas, as they are called, are now too dry in their upper reaches to support marsh vegetation but are so wet in their lower reaches that they are more pond-like than marsh-like. True Everglades marsh vegetation persists only in the middle sections of the water conservation areas. The conservation area marshes also receive poor-quality runoff from agricultural and urban lands. Pesticide residues and oxygen-demanding compounds in the waters discharged into these areas may lower the populations of, or even eliminate, many invertebrates that are important in the wildlife food chain. Poor-quality runoff also promotes overgrowth of cattails, a prolific plant of limited habitat value for wildlife. Because conditions such as these affect marshlands statewide, many wildlife species struggle to survive even though we still have 3 million acres of marsh left.

Wild Florida Is Rapidly Disappearing

Clearly, wild Florida is rapidly disappearing, and along with it many formerly abundant species of wildlife. The only real hope for stemming the tide of habitat loss is to prevent urban and agricultural development from gobbling up the last remaining high-quality wildlife habitats remaining in Florida. Most people working on this problem agree that the best way to protect wild Florida is through land acquisition by public agencies. Sadly, there seem to be too few tax dollars available to buy enough undeveloped land to assure all species of Florida wildlife a safe place to live in perpetuity. Let's hope that, somehow, Florida's citizens can afford to buy enough land before it's too late...before any more species of wildlife slip into extinction.

Randy Kautz is the Nongame Habitat Protection Coordinator in the Commission's Office of Environmental Services in Tallahassee.



Above right: The Arc Lamp was the first gasoline pressure lamp to bear the Coleman name. Originally, it was called the "Efficient Lamp."

From the Arc Lamp to the Ultimate Lantern

By Eloise Shick

Larry Franklin panicked. Staring into the darkness shrouding the choppy waters of the Atlantic Ocean, he realized he was lost. His boat had stalled, and he had drifted out to sea while he worked on the engine. Franklin was off course... lost...disoriented. He didn't know how to get back to his home and wife in Daytona Beach.

Then he saw a tiny flash of light and headed toward it. Thirty minutes later, Franklin was safely ashore in the thankful arms of his wife. She had paced the shoreline for hours, swinging the powerful, life-saving portable lamp — the Coleman lantern.

The letter of gratitude the Franklins wrote to the Coleman Company was one of hundreds received each year from all over the world. For millions of fishermen and campers, "Coleman" is synonymous with light. The lanterns illuminate Baghdad bazaars and igloos of Arctic Eskimos. Big game hunters frighten wild beasts at night with Coleman lanterns. Scientists use them to attract rare insects. Montana sheep herders employ them to keep wolves at bay. When a Coleman lamp was used as a signal in Colorado's Mesa Verde National Park, a rancher 40 miles away mistook it for a new star!

But few know the story about the man who invented this Aladdin-like lamp, the man who dared create a gasoline lantern at the birth of the age of electricity. The brains behind this success story belong to William C. Coleman.

Coleman, born in New York in 1870 to farming parents, moved to Kansas, where he grew up and attended college. After two years of law school, Coleman hit the road to sell typewriters.

One day in 1899, he found himself in a small general store in ▷

Alabama. Coleman, who was handicapped by poor vision, was impressed with the bright, white light given off by the gasoline vapor lamp. It operated on a unique principle — compressed air from a pump made gas vapor, which burned in a mantle. But the lamp had many flaws.

Coleman decided to quit his job and began selling the lamp full time. He borrowed $3,000 to purchase all rights to the device from the manufacturers. He promptly redesigned the lamp, correcting the defects that prevented it from working properly.

In 1900, W.C. Coleman founded the Hydro Carbon Light Company to manufacture his lanterns. Slowly, word of Coleman's lamps began to spread. And on Oct. 6, 1905, he made history in Wichita, Kan.

"W.C." hung his lamps from poles around the Fairmount College gridiron, making it the first regulation football game to be played under lights. The opposing team, Cooper College, is now Wichita State University.

Cautioned by friends that electricity would be his company's death knell, Coleman remained undaunted, insisting that electric light could not compete with a foolproof, portable outdoor lamp.

"Hurricane-force winds cannot blow out a Coleman," boasted a company official. To demonstrate, a lighted Coleman lantern was towed behind an airplane. While aircraft of the day weren't very fast, probably reaching speeds of up to 100 mph, the fact remains that the light didn't go out.

"Pouring rain won't douse a Coleman, either," the company claimed. Of course, plunging it into water will extinguish the light due to lack of oxygen. But the mechanism won't be hurt. Each year, hundreds of fishermen drop their Colemans into lakes and retrieve them unharmed, except for broken glass globes or mantles.

Story has it that a business associate once remarked to Coleman that his lamp was too good. He wanted to know how Coleman could stay in business if the product never wore out.

Coleman replied, "We'll sell more lanterns in the second half of the century than in the first." He based his statement on two factors: his dream of reaching the dark corners of the world and his belief in America's great camping boom. He died in 1957, at the age of 87, but not before his prediction was well on its way to coming true. On Nov. 17, 1986, the Coleman company produced its 40 millionth lantern.

In his later years, Coleman turned the business over to his two sons, Clarence and Sheldon, while he indulged in fishing and canoeing trips. The younger Colemans glow with pride when they speak about the file marked "Emergencies." Long ago, their father proclaimed a unique policy: Coleman dealers were to donate the use of their entire stock of lanterns in any community emergency.

Through the years, this has reportedly cost the company more than 10,000 lanterns. Five thousand lamps were used in the great Ohio flood of 1937. Only 3,000 were returned. When a tornado hit Flint, Michigan in 1953, 200 Coleman lamps were lent to help guide victims from the wreckage. Paradoxically, 202 came back!

Many major discoveries deep inside the earth were aided by Colemans. Perhaps the most famous was a find in the world's largest cave more than 60 years ago. A team of explorers wormed their way into an unknown region of Mammoth Cave, Ky., only to find a huge rock blocking their way. The passageway beneath the boulder was only eight inches high.

The guide tipped the Coleman on its side and inched in after it. The exploration team followed and crawled for 350 feet until they came to a wider space. The group discovered a vast new section of the cave, dwarfing anything previously known in the cave's other reaches. Glistening crystals lined the walls for 7,000 feet. Gypsum flowers hung from the great domed ceiling. Coleman lanterns cast the first light on this geological treasure buried for millions of years.

The lantern that rolls off the assembly line today is referred to as "the ultimate lantern." While, undoubtedly, the Coleman lantern deserves that accolade, it may have surpassed its own tribute. The company recently introduced a propane-filled lantern with electronic ignition. You don't need a match to light it. Just turn on the gas, press a button and, in a second, the lantern glows brightly.

It's a far cry from the early days, but glowing proof that a lampmaker with poor vision has spread more light around the world than any other man. Well, except for Thomas Edison.

Eloise Shick is a public information officer at Vanderbilt University in Nashville, Tenn., and is also a free-lance writer.

The modern "Ultimate Lantern" may be surpassed by a propane-filled lantern with electronic ignition.

PHOTOS COURTESY OF THE COLEMAN COMPANY

Delicate Balance

Species: Panhandle Lily (*Lilium iridollae*)
Florida Status: Endangered
Federal Status: Under Review For Listing

The Panhandle lily is a perennial herb found only in the four westernmost counties of the Florida Panhandle and in two adjacent counties in Alabama. For most of the year, these lilies consist of inconspicuous clusters of linear leaves arising from underground bulbs. In July and August, however, they produce solitary flowering stems, which may rise 4 to 6 feet above the ground. At midstem, the leaves are arranged in whorls, but above midstem they are small and few. A single terminal bloom is the norm, although occasionally there are multiple flowers on a stem. The showy flower has six strongly recurved yellow tepals (petals and sepals) which are marked with numerous, deep red spots. The six stamens extend far beyond the tepals and terminate in the large, reddish-brown, pollen-bearing anthers.

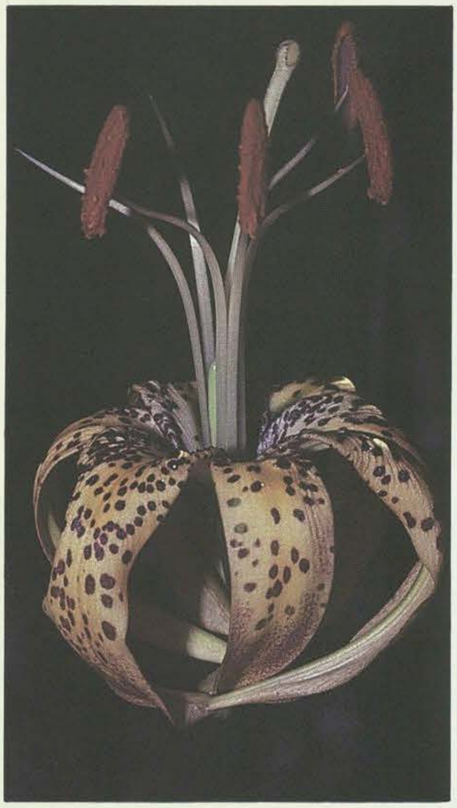
Two similar species of lilies occur east of the Apalachicola River, in Liberty and Leon counties. They are distinguished, however, by their orange to orange-red flowers, which are spotted with purple. Within the Panhandle lily's range there are no similar species.

The Panhandle lily is found in wet seepage habitats and usually grows in close proximity to permanent flowing water. It is most often found growing in the transition zone between open, sunny herb bogs and the more brushy, shady shrub bogs.

(**Editor's note:** For a more detailed discussion of these habitats, see "Florida Wetlands: Seepage Bogs" on pages 32-37 of this issue.)

Several factors have contributed to the decline of the Panhandle lily throughout its range, the foremost being elimination of seepage bog habitats. Although some bogs have been filled or drained intentionally for conversion to agricultural or residential use, others have been degraded by siltation caused by runoff from adjacent roads and fields. Much more far-reaching and insidious has been the gradual transition which has resulted from the long term exclusion of fire. In the absence of fire, the open, sunny bogs required by this species are gradually invaded by tall, woody shrubs, which shade out the low-growing, herbaceous vegetation that characterizes herb bogs.

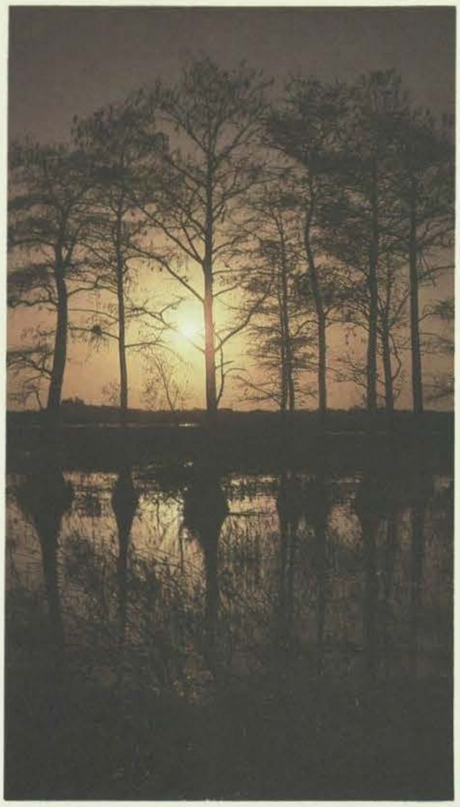
Grazing has also had a deleterious effect on the Panhandle lily, through direct consumption by cattle and through erosion of soils and alteration of hydroperiod, which can result from frequent trampling of the delicate bog vegetation. It is not known to what extent collecting these endangered plants may have contributed to its decline, but collecting is now severely restricted by Florida law.



PAUL MOLER

Erosion, loss of seepage habitat, encroachment by other plant species, human activities, and other destructive pressures have reduced the availability of habitat required for this species. Only about two dozen localities remain where the Panhandle lily is known to occur. At several of these sites, numbers of lilies appear to be very small; fewer than a half-dozen sites are thought to support healthy populations. The three large, public land holdings in the area (Eglin Air Force Base, Blackwater River State Forest, Conecuh National Forest) afford the greatest potential for the habitat management needed to assure the survival of this species.

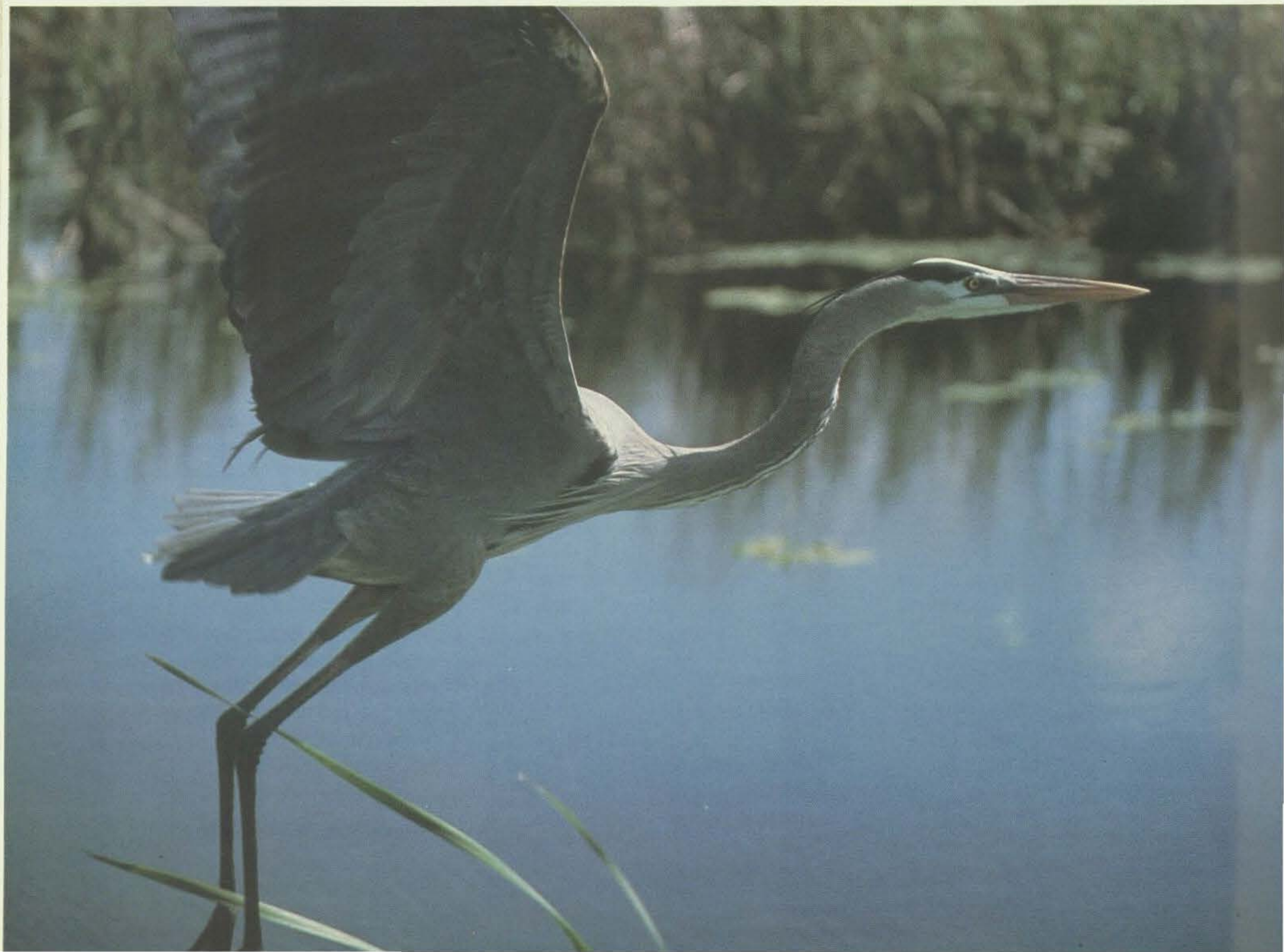
— Paul Moler,
Bureau of Wildlife Research



Ralph Curtin's

WILDLIFE PHOTOGRAPHY

Text and Photographs by Ralph D. Curtin



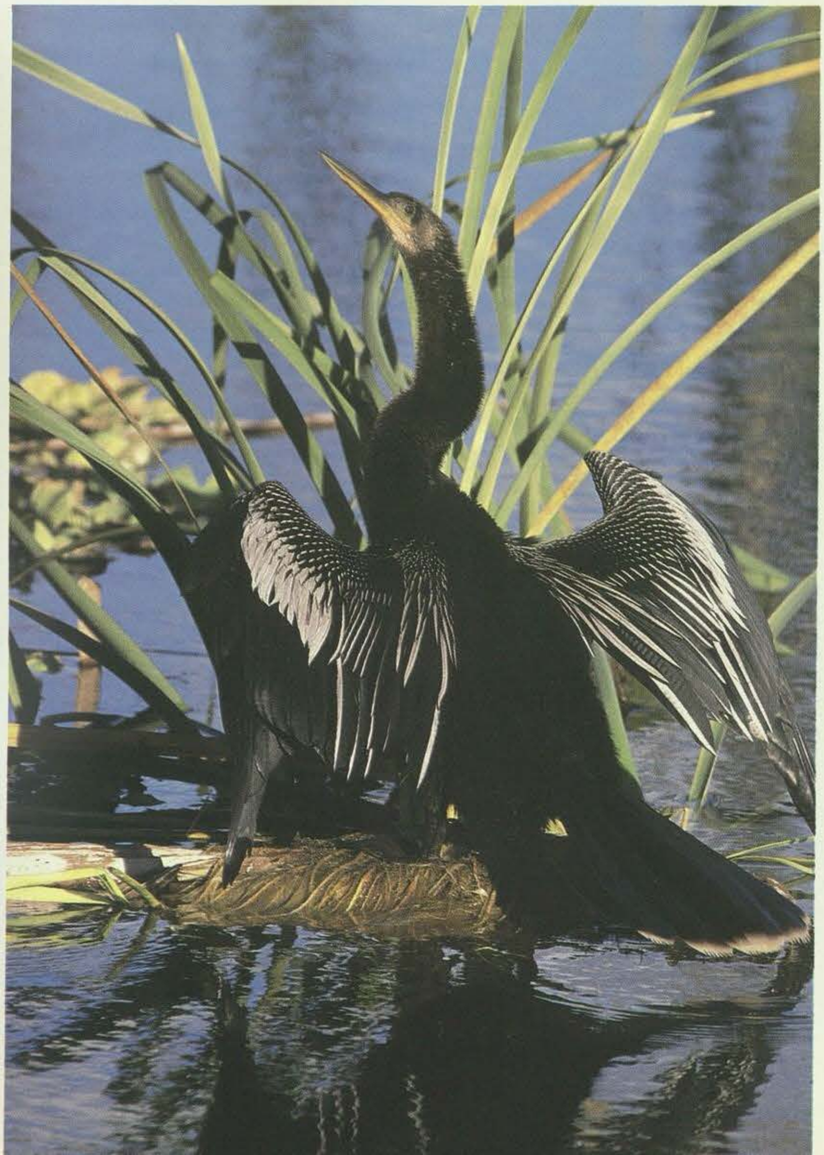
My first view of a great blue heron lifting off from a wet prairie at Loxahatchee Wildlife Refuge was a sight to behold! (See photograph page 10.) One would think its 7-foot wingspan and strident squawk, like some prehistoric bird's protest to scare away intruders, would clear the preserve of any other species. Of course, the many other forms of avifauna that frequent the sanctuary, both indigenous and migratory, are quite used to the cry and rarely even ruffle a feather. But for humans, especially a native New Yorker just relocating in Florida, it was quite a thrill to experience.

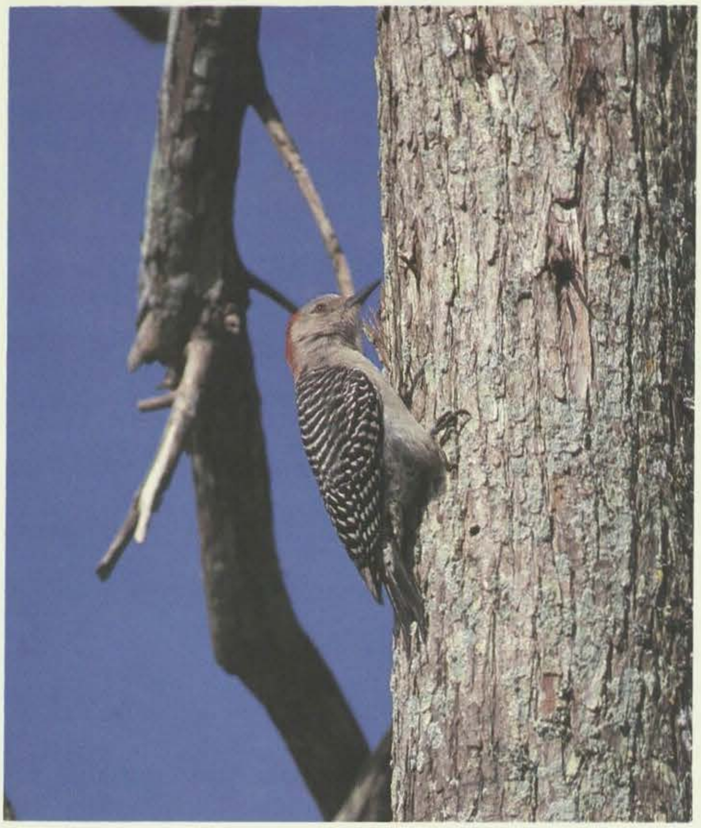
Finding the Loxahatchee National Refuge, in Boynton Beach, was a boon to this hunter-turned-photographer. Its vast expanse of 145,000 acres, portioned off into tree islands which are linked to sawgrass stands and sloughs, accommodates numerous photogenic wading birds. In fact, anyone with or without a camera can have a ball at any wildlife conservation area. By applying the same spirit, perseverance, skills and tactics of a committed hunter, you can bring home some fine "trophies" to hang on the wall.

Whether you are a novice or an experienced shutterbug who longs for an economical "shoot," you can generate your own excitement simply by exploring a nearby preserve. What's more, you can weave in the pleasure of viewing wildlife while enjoying the challenge of continuously experimenting with and operating all that high-tech photo equipment you bought in anticipation of your dream vacation.

A case in point: one morning at Loxahatchee a dramatic scene unfolded. Without warning, a giant alligator climbed up an embankment with a large turtle between his jaws. Never having seen this kind of action, I quickly aimed my 35mm camera with 400mm lens and "shot" — bagging my first reward for the day. (See photograph page 12.) He then turned and slithered into the waterway, with his meal still clenched in his jaws.

Another episode unfurled early one morning as I patrolled a levee. Spotting a wading great blue heron, I furtively approached to within 30 feet and quietly readied my gear. Twenty minutes passed before the giant bird moved. Suddenly he went into a stalking pattern, then froze momentarily as my heart raced with anticipation. He lunged into the sawgrass and emerged with a 5-foot black snake in his mouth. As the snake whipped about, the heron quickly swallowed the serpent then stood motionless, digesting his dinner. ▷





Whether you are a novice or an experienced shutterbug who longs for an economical "shoot," you can generate your own excitement simply by exploring a nearby preserve.

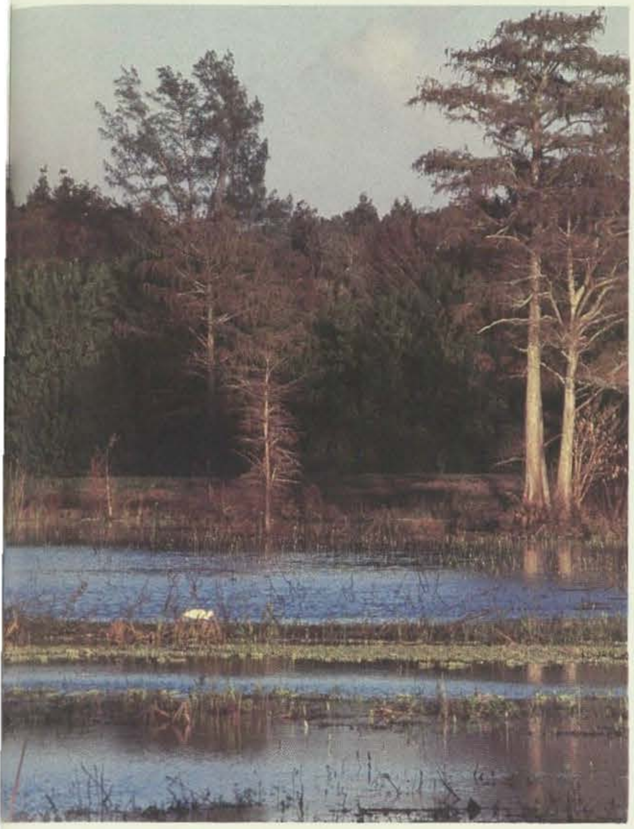
Bagging the prize is easy if you have a plan. Despite the serene sanctity of the refuge, most wildlife is skittish and unapproachable to photograph, even from an appreciable distance. Here are a few suggestions to help you make the most of your photographic expeditions:

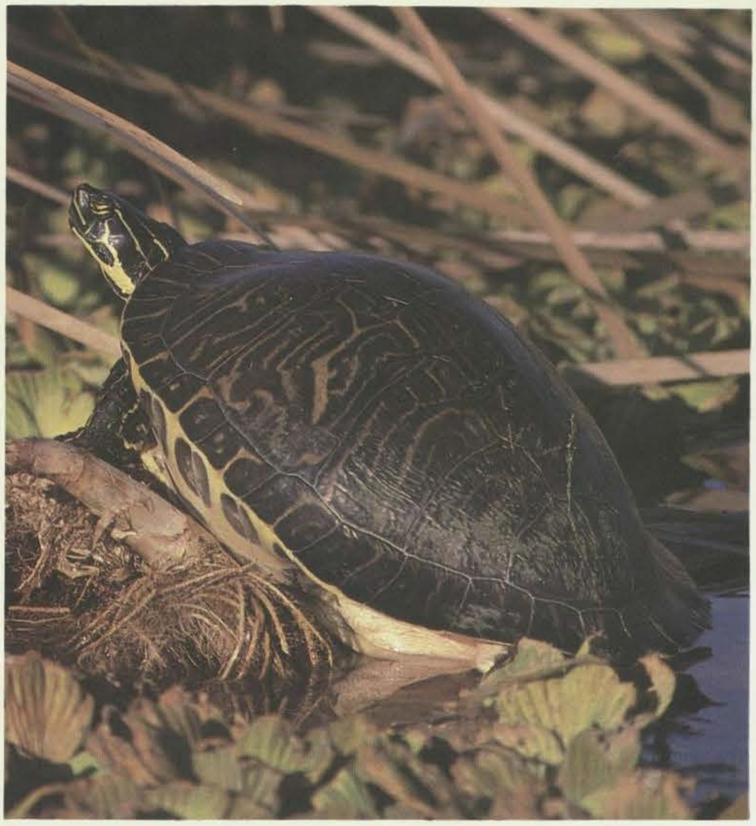
Organize your excursion: Preset an arrival time (the earlier the better); choose your equipment beforehand; determine your targets in advance. Aimless photography nets poor results. If you know there are anhingas residing and need them for your collection, set out to get them first. If you have time afterwards, drop back to pick up the spoils of your secondary targets.

Organize and pack your gear: Before embarking for the day, be sure you have the following: clothing that blends with the surrounding flora, insect repellant, your camera and accessories.

Equipment should include:

- An adequate supply of film. Avoid the horror of tracking, waiting and finally the moment to





"squeeze off" a shot, only to be fouled by a lack of film, like a hunter running out of ammunition just as his elusive quarry appears in the rifle scope.

- Tripod or monopod to ensure a sharp image. Quality photos require slow films (low ASA speeds) which demand a camera support in most cases. Devise a sling to carry it so your hands are free.
- The longest lens you own. In order for your subject to fill at least 75 percent of the frame you'll need a good telephoto lens.
- A motor drive is a good investment for sequence and fast action shots. However, most birds will be airborne the second they hear the winder.

Sometimes your subject will be so intrigued by its next morsel of food that you can creep up gingerly, put on a small telephoto lens (80-200mm) and come to within 15 to 20 feet. At other times your subject can scan for food and watch you simultaneously, requiring you to keep your distance and switch back to the long lens. Therefore you should carry both lenses.

Being on the alert must be an intrinsic characteristic of the refuge photographer who wants decent action images. Once, while I was photographing a little blue heron, he unexpectedly dropped from atop a bush into the marsh, caught a tasty insect, then lifted off. Had I not been ready to pan with a 400mm and winder, I would have missed the takeoff.

Very infrequently, you'll encounter a few water birds like the egret or ibis whose actions make them superb photographic subjects. They gracefully move from side to side, take a few steps, then stand motionless , as if posing. In rare times like that, you merely sit down on the nearest patch of dry grass and fire away.

With the right equipment, a little experience and a nearby locale in which to practice your hobby, anyone who enjoys the outdoors will find wildlife photography to be an exciting and rewarding pastime.

Mourning Doves Nest in Interesting Places

Text and Photographs by Thomas G. Bell, M.D.

Over the past several years mourning doves (*Zenaida macroura*) in my St. Petersburg neighborhood have chosen some interesting and unusual nesting sites.

Other nesting bird species are able to raise their young — despite the ever-present cats, squirrels, raccoons and waterfront rats — due to the strength and strategic locations of their nests. Starlings choose the eaves of my house and narrow crevices in the trunks of large oak trees. Yellow-crowned night herons use the very tops of pine trees. The resident cavity-nesting red-bellied woodpeckers use a relatively small nest opening to keep out most predators. House sparrows may have found the safest location of all inside the metal davits on the dock.

Mourning doves, on the other hand, build rather flimsy and relatively flat platform nests in unconventional locations such as household water meter boxes and security lights, ladders and even right on the ground. Over the years, almost all the nests I've observed in my area have been between five and 15 feet off the ground, although I've read that they often build nests 25 feet up or even higher.

I have always noted two white eggs in the eight to 10 nests in my neighborhood and have occasionally observed nesting activity year round. I have watched a female lay the first egg in the late afternoon and the second egg the next morning.

The two-week incubation duties are shared by both parents, with the female usually sitting at night and the male relieving her at dawn. The two eggs may hatch several days apart, giving a distinct survival advantage to the first chick. During the first days of the short two-week stage from hatching to fledging, the young birds' diet is pure pigeon milk. This substance is a highly nutritious, cottage cheese-like liquid, rich in vitamins and calcium, which is sloughed off skin tissue from the crop lining of either parent. The offspring get the milk by thrusting their bills into the adult's throat, like many seabirds. I have observed male parents supplying more milk than females and to my knowledge, in no animals other than doves and pigeons, do males lactate to feed their young.

Partially digested seeds, worms and insects are regurgitated by the adults at first to supplement, and soon to replace the milk. The chicks' weights increase quickly in the two to three weeks after hatching as the adults continue to feed them before beginning a second brood.

Once the young birds have progressed through a molt of juvenile feathers, they are practically indistinguishable from their parents. In my area the mortality rate is high, especially for the second hatchling. In addition to predators, severe afternoon thunderstorms with accompanying high winds destroy many nests with young. Parasites and ants often overrun nests and kill young birds, especially in low-lying or ground nests. Though I've heard of captive doves living up to 15 years in zoos, the average life span in the wild seems to be two or three years.

Above, right: Doves build rather flimsy, flat nests in unconventional locations, such as on household water meters, lights, ladders or in common houseplants.

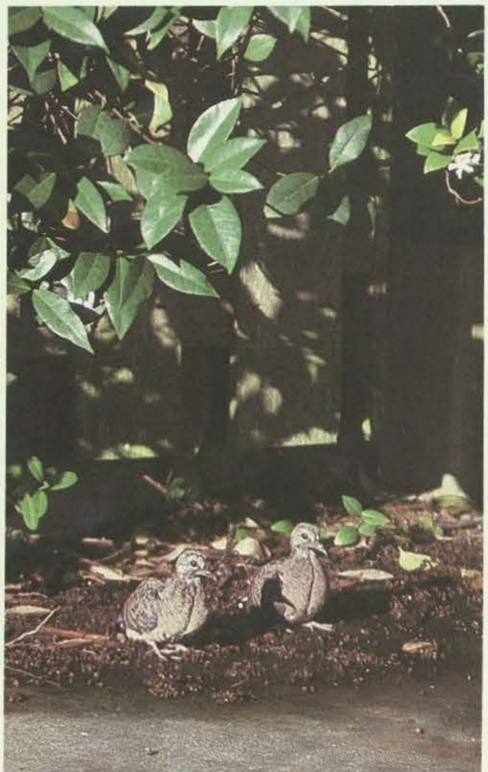
At my birdbath, I notice doves continuing to drink with their heads down in the water while most birds raise their heads after drinking to let gravity aid them in swallowing. This is very rare in the avian world.

The melancholy, lazy "*cooing*" of an amorous pair of mourning doves on spring mornings embellishes the distinctive, soft "*coo-curroo*" of a pair of ringed turtle doves. This beige bird with very dark eyes and a black neck-ring is an unmistakable contrast to the mourning dove. I've enjoyed the beautiful vocalizations, yet I have been unable to locate their nest.

Mourning doves are common local residents in many areas of Florida. Simply provide them with food, water and a protected environment — then sit back and enjoy the soothing, early morning "*coo*" of these birds in your neighborhood.

Dr. Thomas G. Bell, a former high school biology/marine biology instructor, practices ophthalmology in St. Petersburg. He is an avid bird watcher and has traveled worldwide on numerous wildlife-watching excursions.

During the first days from hatching to fledging, the young birds' diet is pure pigeon milk.



MOURNING DOVES

Hunting a Florida Favorite

By Carolee Boyles-Sprenkel

TOM EVANS

The challenge of the sport brings thousands of hunters to corn and peanut fields year after year.

Opening day of dove season — hunters began gathering in camp yesterday, and continue straggling in this morning. After a brunch of grits, eggs, venison sausage and biscuits topped with cane syrup, hunters climb into pickups and 4x4s and head out. They spread out around the edges of corn and peanut fields and wait for noon.

At precisely 12:00, guns are loaded, safeties come off and the season opens on what, for many hunters, is the most fun they've had all year. Spent shot drizzles down as the birds arrow across the field. By the end of the afternoon, the hunters will have expended boxes of shells — some with little to show for their effort.

The challenge of the birds and the camaraderie of the sport bring thousands of hunters back to the field year after year, according to Gordon Spratt. A biologist at the Commission's Ocala regional office, Spratt said dove hunting has always been a highly social sport.

"The big shoots were associated with the large agricultural crops that were grown in the past," he said. "The farmer or plantation that had the big crop would invite friends,

CAROLEE BOYLES-SPRENKEL

workers and family. There was food, the afternoon shoot, then more food."

Dr. Franklin Percival, assistant unit leader of the Florida Cooperative Fish and Wildlife Research Unit in Gainesville, elaborated: "Where doves congregate around agricultural areas, hunting of doves has been more of a social sport than other forms of hunting. It's unlike rabbit hunting or still-hunting for deer where you're trying to get away from people."

This social tradition, though slightly different today, still pervades the sport. "It's more organized," Spratt said. "People have tailgate parties after the shoot."

Why have doves retained their popularity with hunters? Spratt says their unpredictable flight pattern and speed make shooting them a challenge.

"You have speedy, erratic-flying birds in large numbers, and they are also tasty," Percival continued. He attested to their elusiveness when he said, "I think the national average is about six shots per bird bagged. That's a lot of shells shot for each dove that's actually brought home."

Despite their continued popularity, the annual dove harvest in Florida has declined. For the 1988-89 season, Commission biologists estimate that hunters put in about 432,000 man-days of dove hunting. About 76,000 shooters harvested approximately 1,194,000 birds. By comparison, biologists say that about 105,000 hunters took the field for doves during the 1983-84 season. Fewer people are hunting doves, and fewer doves are being taken each year.

Evidence indicates that doves are still plentiful. Each year, a federal survey is conducted to determine the status of birds in Florida. Commission biologists and volunteers drive a series of 25-mile transects across the state. Along each transect are 50 stops where workers make visual and auditory counts of many species of breeding birds. In 1969 workers recorded 200 pairs of mourning doves. By 1989, the count had risen to 274. Statewide, that translates to an approximate increase of 13 percent in 14 years.

Most of the mourning doves hatched in the state stay here. According to experts at the University of Florida, 98.7 percent of Florida's summer resident doves remain in the state during the fall hunting season.

Dr. Wayne Marion, one of the researchers, said Florida also gets migrants from other states. His data indicate that 57 percent of the dove harvest in Florida is made up of immigrant doves from other states, including Illinois, Missouri, Wisconsin and Georgia.

Solid estimates of dove numbers, though, are hard to come by. Spratt said an in-depth study conducted during the 1960s and '70s showed a population of about 10 million birds.

To come up with a number for 1990, however, requires some extrapolation. Spratt estimated that nationwide, hunters take about 10 percent of the dove population. Applying that estimate to the 1,194,000 birds taken during the 1988-89 season, a population figure of 12 million birds emerges. Although the figure is based on estimates, this still represents a substantial increase in the number of doves statewide.

So why are fewer people hunting doves? The answer seems to lie in the changing patterns of land use. As agricultural crops in Florida ▷

change, farmers plant less corn and peanut acreage than before. As a result, the birds are not forming the large concentrations they did in the past.

"The main factor is a lack of places to go dove hunting," said Frank Smith, the Commission's bureau chief for wildlife management. "A lot of land is posted now, and that's continuing to increase. There aren't as many crops grown that will attract doves as there were in earlier days. I'd say those are the two main reasons for the decline."

But the persistent dove hunter can locate a place to hunt if he or she looks hard enough. Experts agree that birds are plentiful statewide and that hunters anywhere in Florida can find good shooting close to home sometime during the fall.

"There's land all over the state that attracts and holds doves," Smith said. In south Florida, he said, birds reach their peak concentration in October. This coincides nicely with the first phase of dove season, Oct. 6-28.

In the rest of the state, Smith continued, birds appear in October and remain until the end of December. This means hunters will have good shooting not only during the first phase, but during the second and third phases as well. The second phase is scheduled for Nov. 10-25; the third phase is scheduled for Dec. 8 through Jan. 6.

Hunters in the central and northern parts of Florida have an advantage over others because of row crops still planted from the Ocala area northward. But even if you live in an agricultural area, getting to know a farmer still can be difficult. Unless you know someone who's growing row crops, try turning to your county Department of Agriculture Extension Office for help. The agricultural agents in the extension service can put you in touch with most of the growers in your area, and often know which farmers are looking for hunters to lease land for dove hunting.

If corn and peanuts are not grown near where you live but you have access to land, you can plant your own dove field. A small plot, even two or three acres, can provide an excellent shooting ground. Besides corn and peanuts, experts recommend planting either grain sorghum or brown-topped millet. Again, your county Extension Service can give you recommendations on what's best for your area.

(**Editor's note:** Wing shooters must be extremely cautious to abide by laws that prohibit hunting migratory birds over a baited field. Refer to "It's the Law" on page 44.)

And if private land is not open to you, try Florida's wildlife management areas (see the map on page 40). A number of WMAs around the state permit dove shooting on certain days. These dates vary, so check the regulations for the specific management area where you plan to hunt.

So, in terms of the numbers and availability of doves, the future of dove hunting in Florida is bright. The only cloud on the horizon is that there are fewer places to hunt, but that's not necessarily an obstacle. Hunters in the past drove several hundred miles to "traditional" dove fields, and some of that kind of shooting still is available. But many opportunities exist to establish pockets of excellent dove hunting anywhere in the state by planting small acreages of grain crops. Good dove shooting statewide may take a little more ingenuity than it did in the past, but it's certainly worth the effort.

This story previously appeared in ***Florida Game & Fish Magazine*** *and was updated by the author, a frequent contributor.*

BARRY MANSELL

CHARLIE HEIDECKER

The Wandering Eagles

By Petra Bohall Wood

The rustle of saw-palmetto and singing of woodland birds are the only sounds that I hear this cool, March morning. Suddenly, the shrill cries of a bald eagle pierce the still morning air. State and federal banding permits in hand, we arrive at our destination — a bald eagle nest perched high in a towering pine tree. Climber Wayne Norton quickly dons his climbing spikes, harness, safety belt and rope, and ascends the tree. Although the adult eagles call continuously and circle above the nest, they do not dive at Wayne. Their fear of humans keeps them respectfully at a distance.

At the top, Wayne balances on a sturdy limb and peeks over the edge of the nest — two 8-week-old bald eagle chicks peer back. After careful maneuvering to gain access to the massive, 8-foot-wide nest, he gently restrains the young eagles, puts them in a burlap bag, and lowers them to the ground. Research assistant Linda Waite and I weigh, measure, band and attach a radio transmitter and a numbered wing tag to each nestling eagle. Then, when they learn to fly, I can monitor their movements to learn what Florida habitats are important for young eagles and where they go when they leave the state in the summer.

Once the tag and transmitter are properly fitted and attached to the young eagles, back into the bag they go. Norton hoists them 85 feet up, releases them into the nest, and rappels down. We quickly pack up our equipment and leave the nest tree. Looking back, we see a relieved mother alight on the nest and reunite with her young. In about three more weeks, they will be able to fly. About two months later, the young eagles will leave Florida to go north. With luck, I will know when they leave and, with the help of cooperating researchers and observers in northern states, I will know where they go.

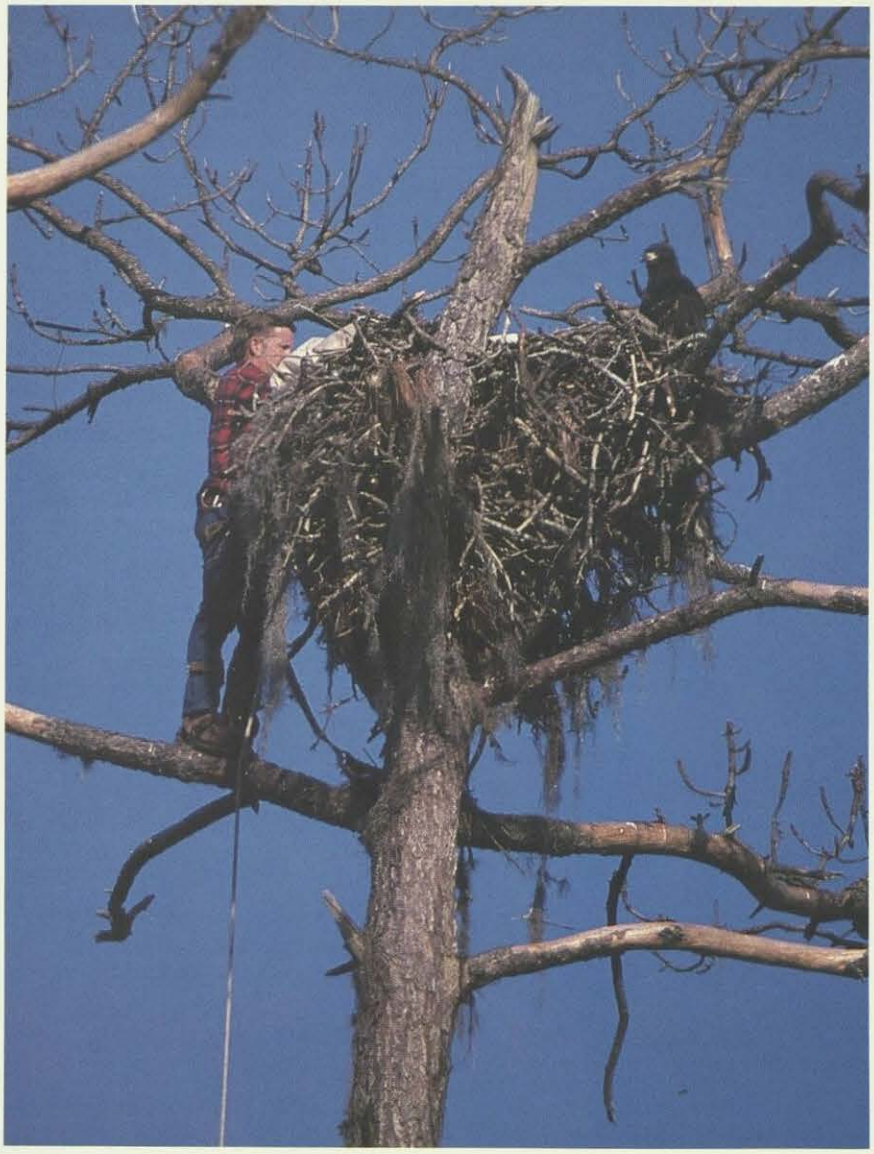
The number of eagles nesting in Florida has been increasing gradually since the mid-'70s.

"In 1989, 439 eagle pairs nested around the state, and they raised 474 young," said Steve Nesbitt, a biologist with the Commission and coordinator of bald eagle surveys in Florida. Unfortunately, no one knows exactly what happens to these young once they learn to fly and leave the nest. Eagles reach maturity and nest for the first time at about five years of age. Where are they and what habitats do they use during those five years? As a wildlife ▷

CRAIG KAPPIE

Sightings of wing-tagged Southern bald eagles will help to determine migration routes and summering areas. See distribution map, page 47.

Climber Wayne Norton prepares to enter a bald eagle nest.


CRAIG KAPPIE

biologist studying eagles, I hope to find answers to these questions from the research Dr. Michael Collopy and I are conducting at the University of Florida, Department of Wildlife and Range Sciences.

For the past four years, I have attached radio transmitters and colored wing tags to young eagles hatched in north Florida nests. To date, I have banded about 100 nestling eagles and put radio transmitters on 44 of them. I loosely wrap bright yellow tags around the right wing of each young bird so I can identify them later. The tags, also called patagial markers, fit on the wing at a natural break in the feathers between the long flight feathers and the short body feathers. The long flight feathers stick out behind the wing and keep the tag from falling off. These tags don't hurt the birds or interfere with their ability to fly. The brightly colored tags allow other people to help me keep track of these birds. In one situation a school teacher in Pennsylvania saw the tag on a young eagle perched on a telephone pole along the Susquehanna River. When he reported the sighting, he discovered it was an eagle that had hatched in Florida.

The radio transmitters put out signals that can be heard as a series of beeps on a special receiver. Each has a different signal, which allows me to distinguish individual eagles up to 50 miles away. Each eagle wears the transmitter on its back between the shoulders, similar to the way we wear backpacks. The 2-ounce transmitters are an insignificant weight to a juvenile eagle, which weighs about 9 pounds when it leaves the nest. The transmitters are powered by small solar panels that catch the sun's rays and convert this energy into electricity. Rechargeable batteries store surplus energy collected by the solar panels, enabling the transmitter to work on cloudy days.

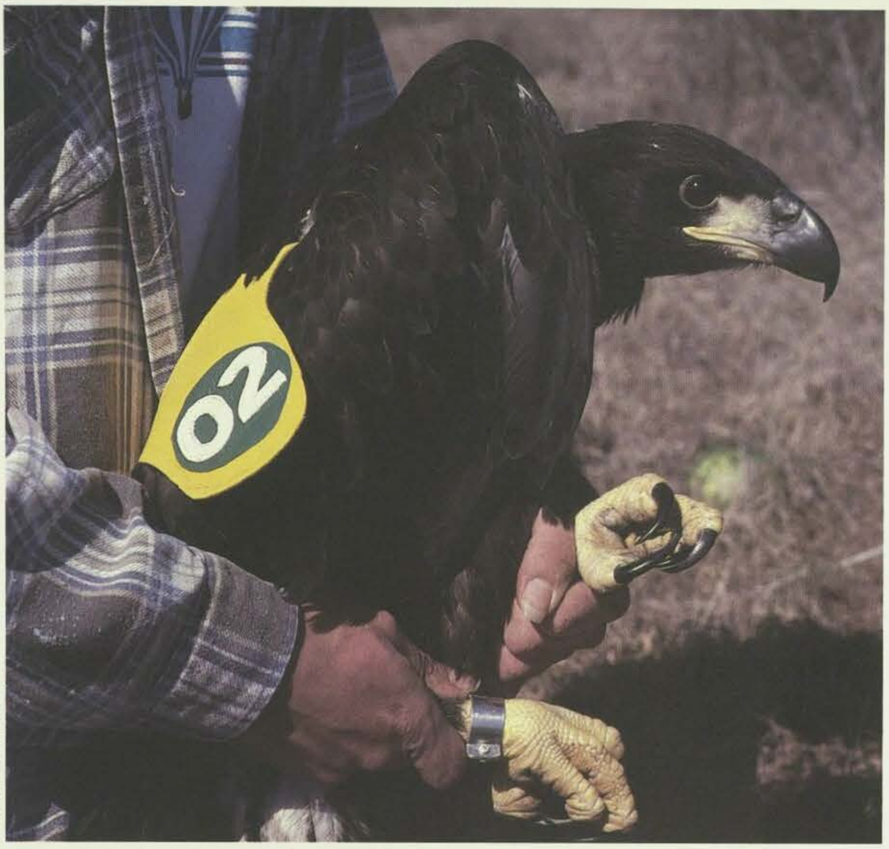
So far, young Florida eagles have turned out to be great wanderers. Immature 1-, 2- and 3-year-old eagles from Florida have spent their summers all along the east coast of the United States and Canada. One eagle has flown all the way to New Brunswick for the past four summers. Many fly over Chesapeake Bay on their way to and from northern states. One turned up in northern Wisconsin. Not all birds go that far. One young male stayed along the South Carolina coast during most of his first summer.

In the 1940s, Charles Broley, an amateur ornithologist, found that the fledgling eagles he banded in Florida went north their first year. Very few of these birds were recovered in Florida. Consequently, many people thought most of these young eagles stayed up north until they were close to breeding age, but no one really knew.

Through a banding and radio-telemetry study funded by the Commission's Nongame Wildlife Program, I have learned that most young eagles return to Florida every fall. The radio transmitters allow for repeated locations of a bird over several years rather than a single location when a bird dies and is recovered.

The annual arrival of mild cold fronts to Florida signals the time to start looking for returning eagles. Most young eagles arrive from September through November, and stay until April or May. A few remain even into July. I use either a plane, boat or truck to look for them. Usually I radio-track from a small airplane because the birds often are in out-of-the-way places where a boat or truck can't go.

Today I securely strap antennas to the airplane struts, then Commission pilot Steve Schwikert takes us soaring with the eagles. He circles high over Paynes Prairie while I listen on the receiver for a tell-tale chirp that lets me know the young eagles have returned to Florida. A loud and slow "*chirp-chirp-chirp*" on the receiver means a bird is near. The receiver reads 5.675, the radio frequency of a young female that fledged near Newnans Lake in 1987. We have located her so many times that it's almost like welcoming back an old friend. He pilots the plane in a tight circle until I locate the direction of the strongest signal. Circling and criss-crossing the countryside, we home in until we find a young eagle perched in a cypress tree near the edge of Lochloosa Lake.


PETRA B. WOOD

Each nesting eagle is weighed, measured, banded, then fitted with a radio transmitter and a numbered wing tag.

Is it 5.675? The blaring "*chirp*" on the receiver whenever our antenna points at this bird means YES! I record on a map the exact location where this eagle was observed. I also record a description of the habitat, what the eagle was doing, and the presence of other eagles.

During their first years, young bald eagles use many different habitats while they are in Florida. Most often they are near lakes or marshes in pine, oak or cypress trees; sometimes in pastures. They tend to congregate in favorite areas on certain lakes. I hope to get a clearer picture of their habitat requirements and important concentration areas by following birds with radio transmitters and compiling sightings of marked birds. Land managers can then better protect and manage important areas for these young wanderers.

How Can You Help?

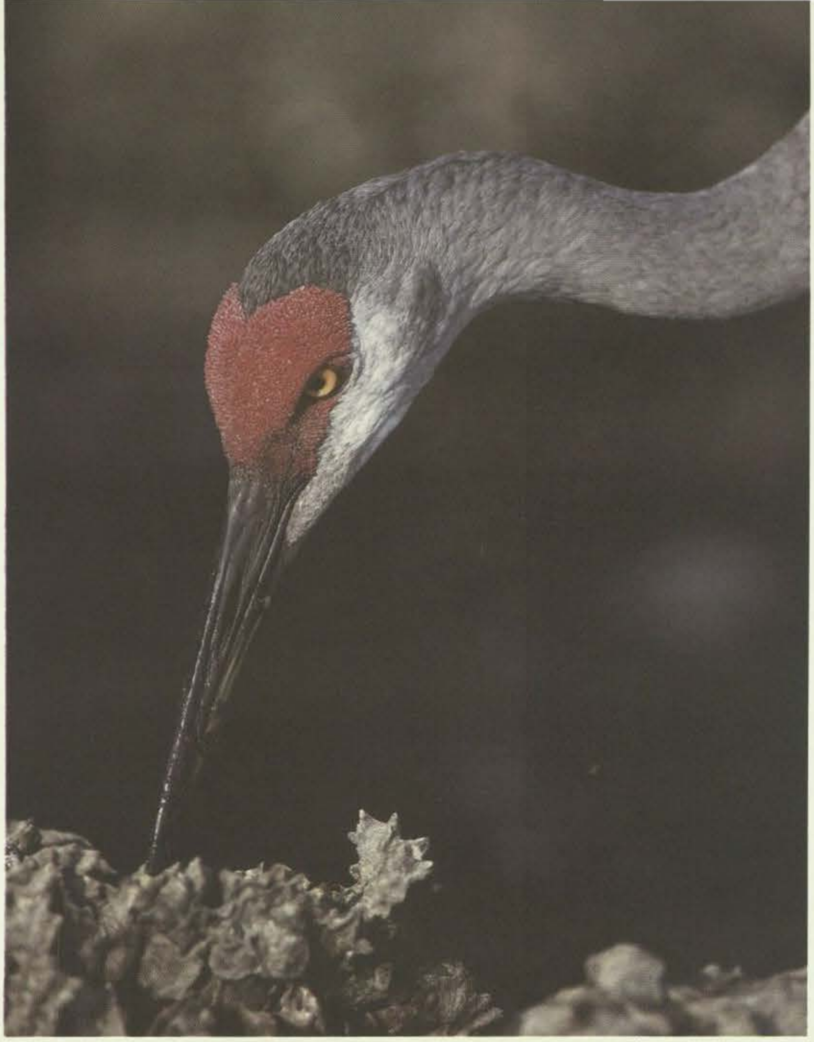
Migrating eagles are returning to Florida at this time of year. Watch for juvenile bald eagles marked with yellow tags on the right wing. Each eagle can be identified by a one- or two-digit white number on a green or red shape on the yellow tag. In 1988, the shape used was a circle. In 1989, a square was used, and in 1990, a triangle. The photograph above shows the positioning of the marker on an eagle. It is important to report the white number and the shape, because a few other states also are using patagial markers with a yellow background.

If you see one of these eagles, please note the shape of the tag and the number, the time and date the bird was seen, the location of the bird, the habitat used, what the bird was doing, and other pertinent details. Please send the information along with your name, address and telephone number to Petra Wood at 117 Newins-Ziegler Hall, University of Florida, Gainesville, FL, 32611 or call (904) 392-1861 to report sightings.

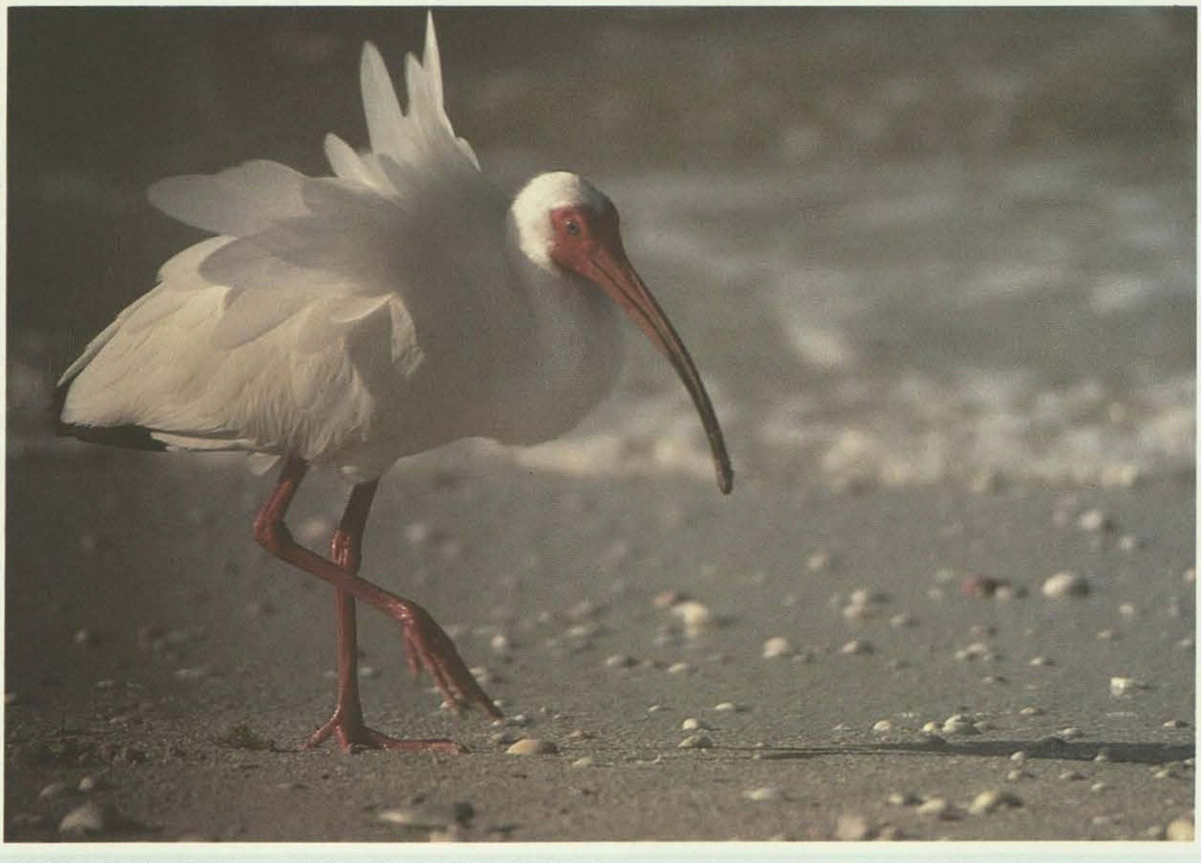
1990 Photo Contest Winners

Wild Birds

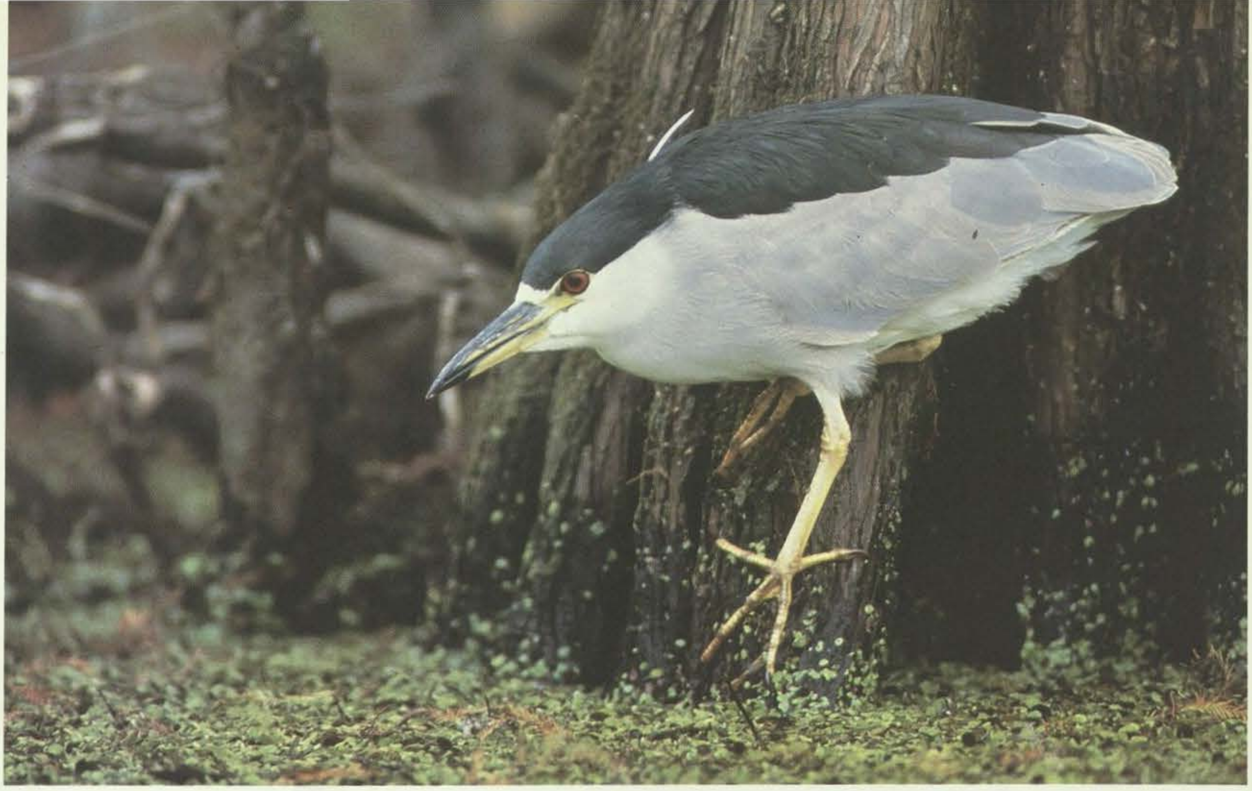
FIRST PLACE: Green-backed Heron with Turtles by Terry Taylor



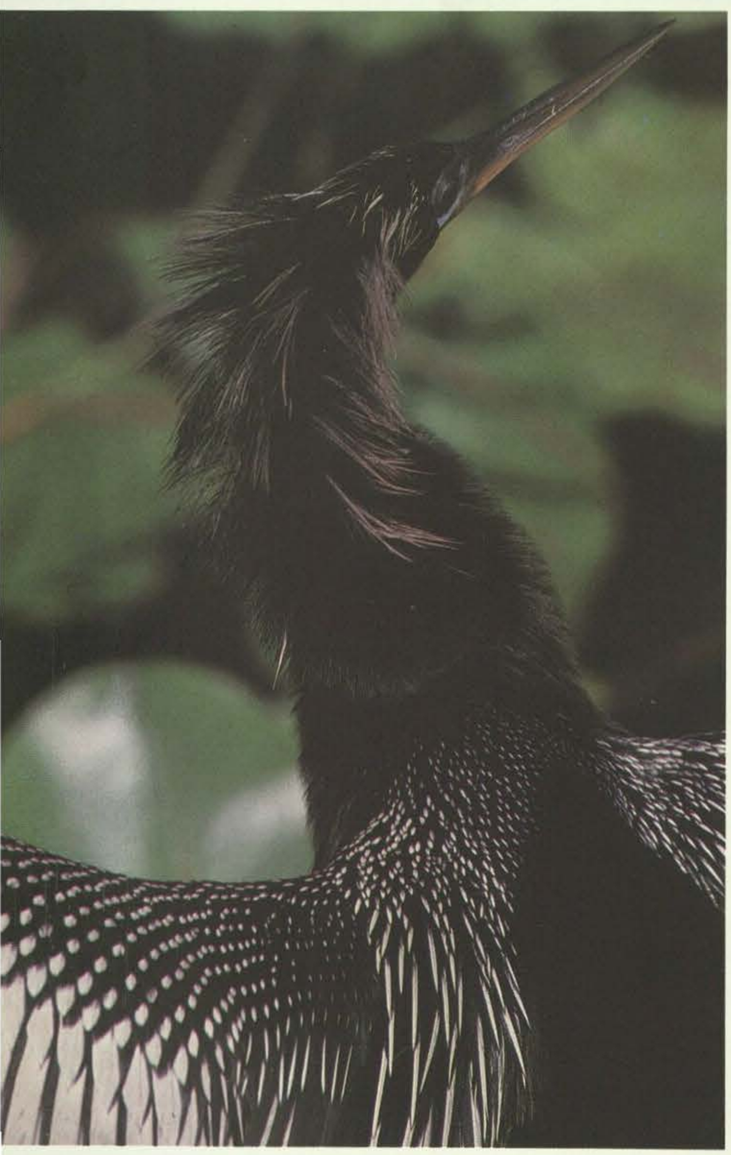
SECOND PLACE (Tied): Sandhill Crane by Sonja Pedersen

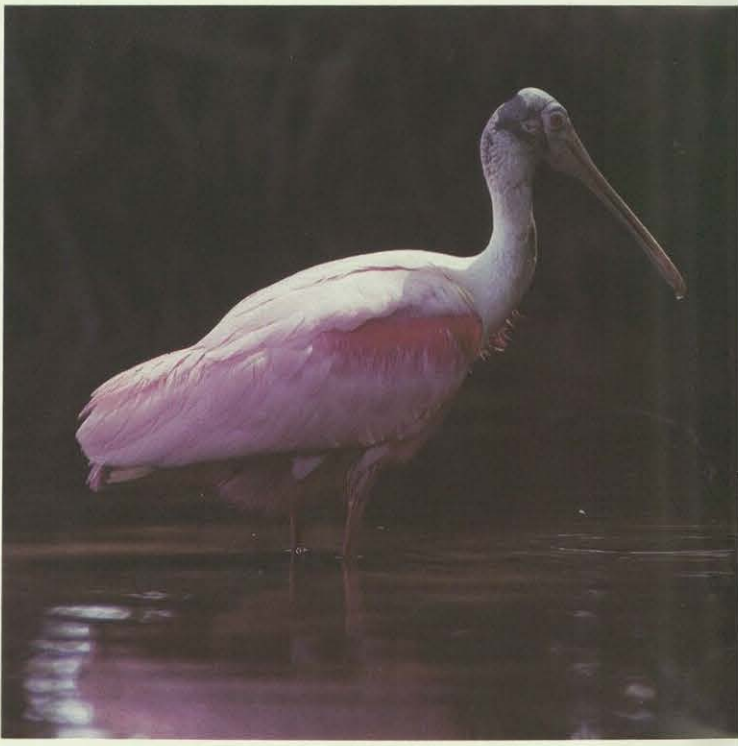


SECOND PLACE (Tied): White Ibis by Mary D. McCoy



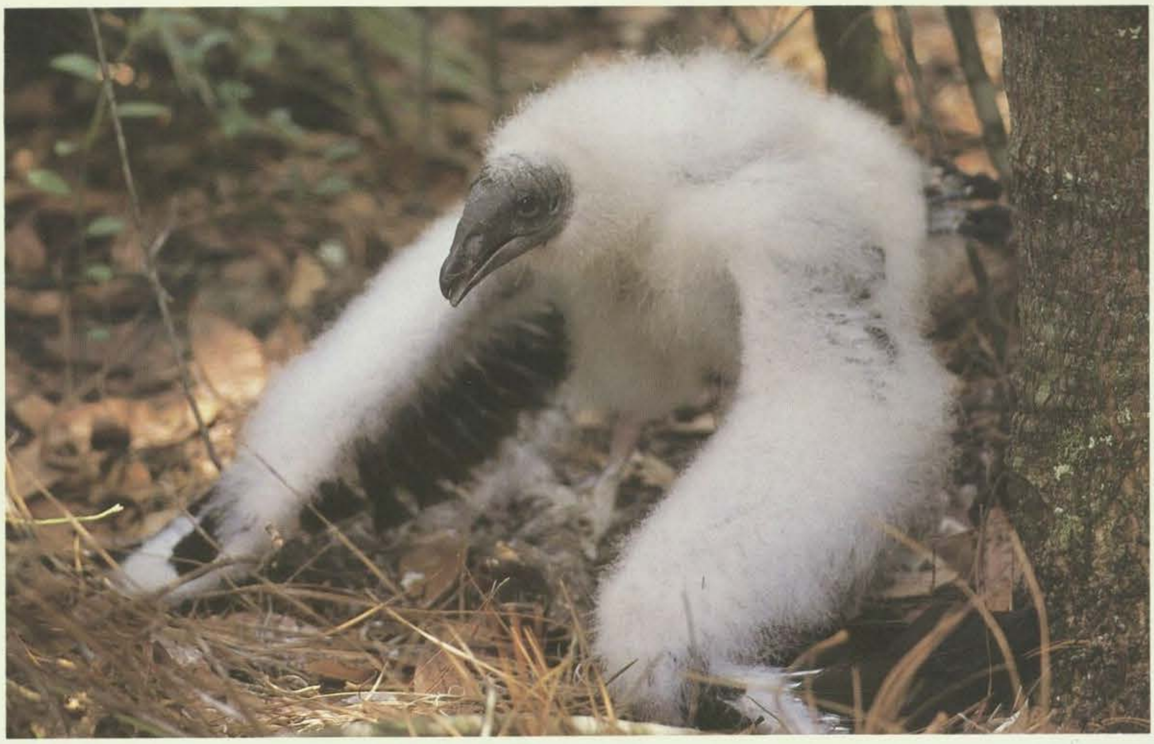
THIRD PLACE (Tied): Black-crowned Night Heron by Paul E. Rich



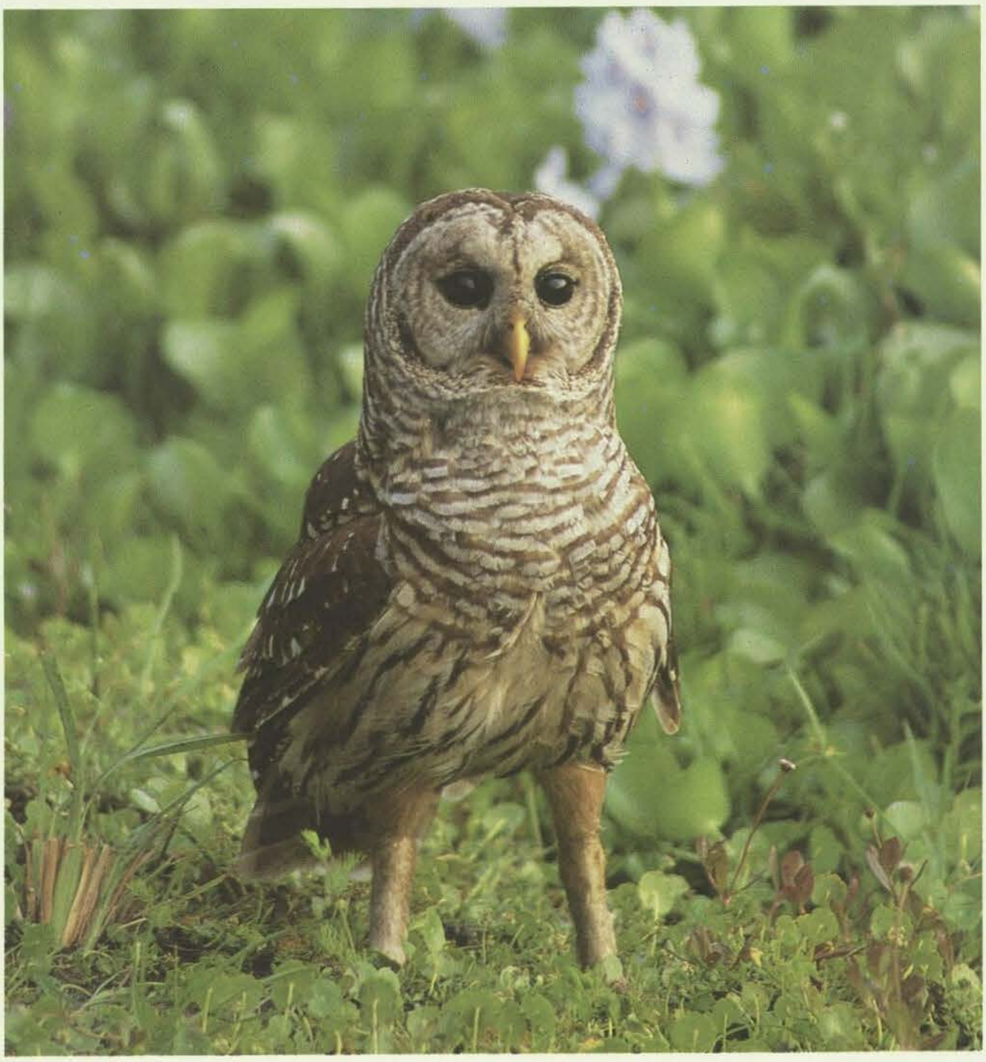


THIRD PLACE (Tied): Roseate Spoonbill by Paul E. Rich

◁ THIRD PLACE (Tied): Anhinga by Barbara Magnuson



HONORABLE MENTION: *Immature Vulture by John Flower*



HONORABLE MENTION: *Barred Owl by Pat Donnelly*

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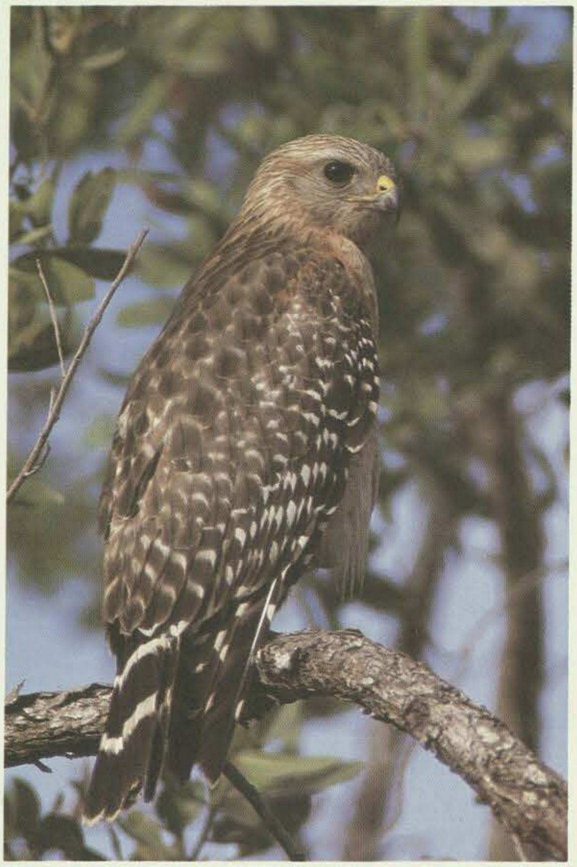
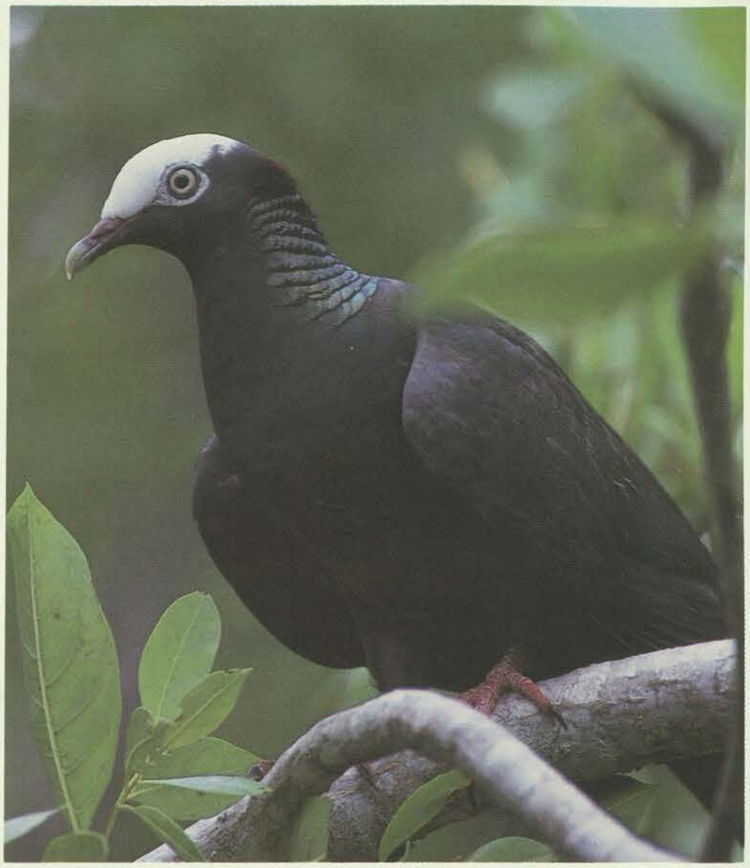
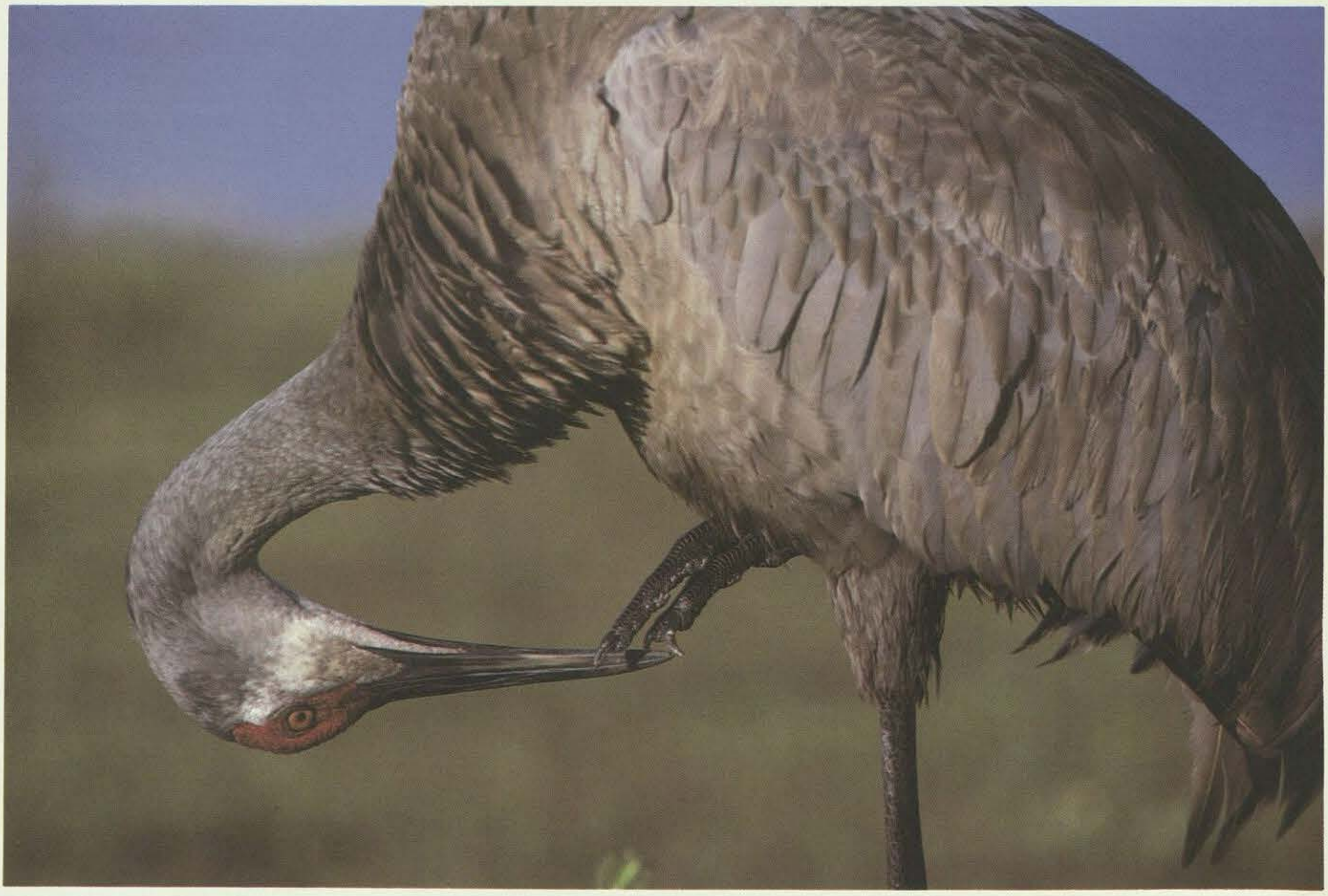


HONORABLE MENTION: *Red-shouldered Hawk by Lisa Bryce*



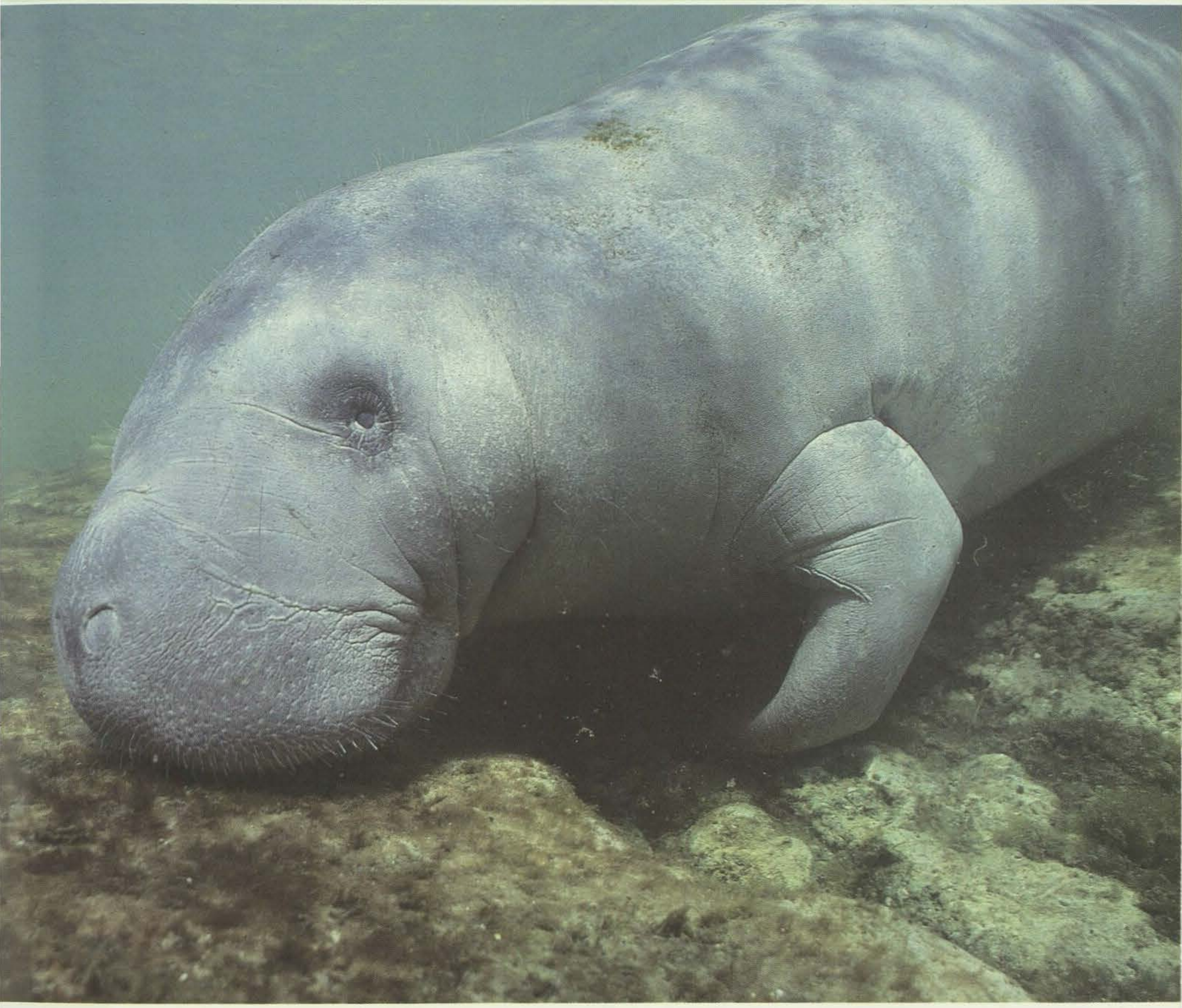
HONORABLE MENTION: *White-crowned Pigeon by Reed Bowman*



HONORABLE MENTION: *Sandhill Crane by Sonja Pedersen*

1990 Photo Contest Winners

Mammals



FIRST PLACE: Manatee by Mark J. Thomas

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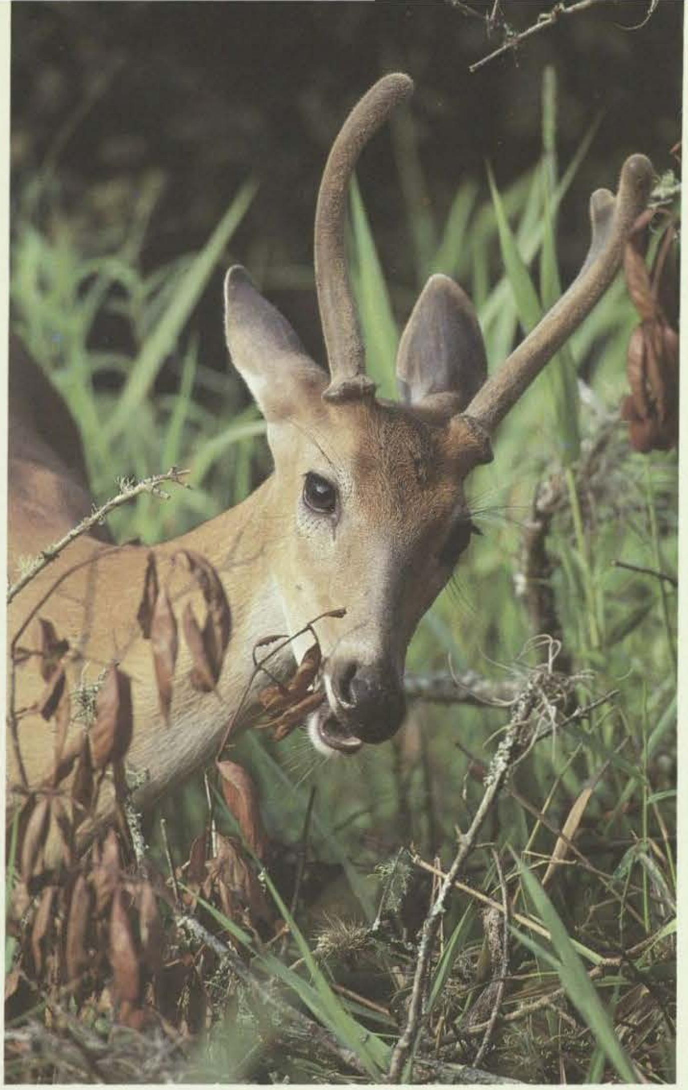
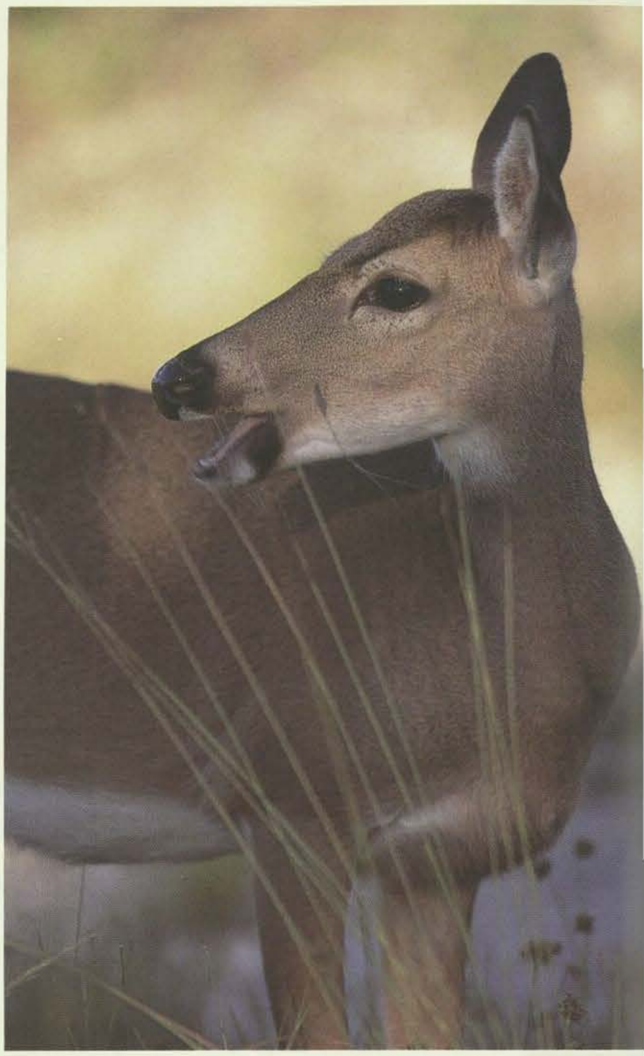
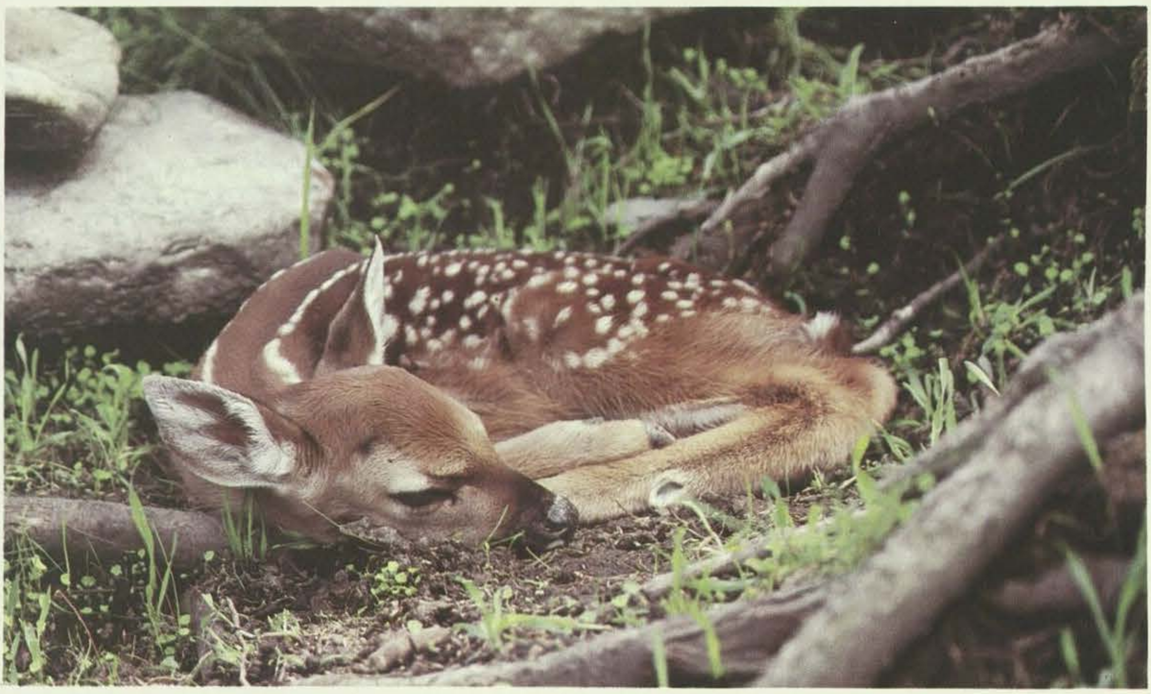


SECOND PLACE (Tied): *White-tailed Deer by Pat Donnelly*



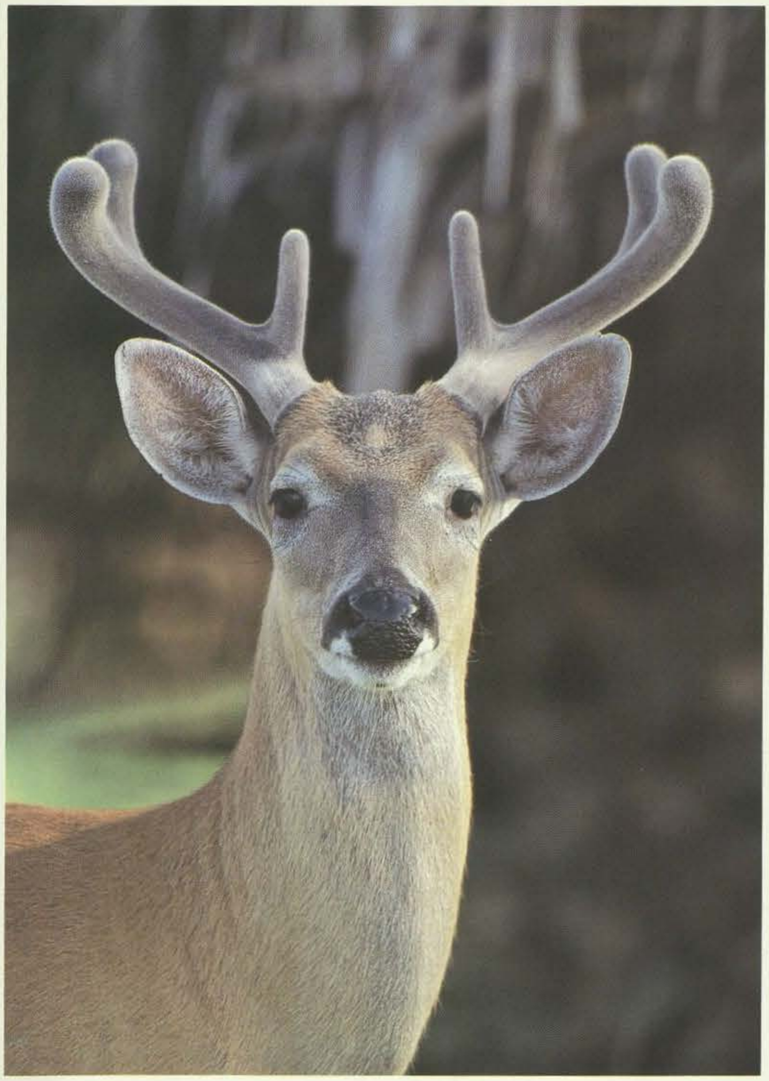
SECOND PLACE (Tied): *Key Deer by Kevin Barry*

THIRD PLACE (Tied): *Fawn by Terry Taylor*



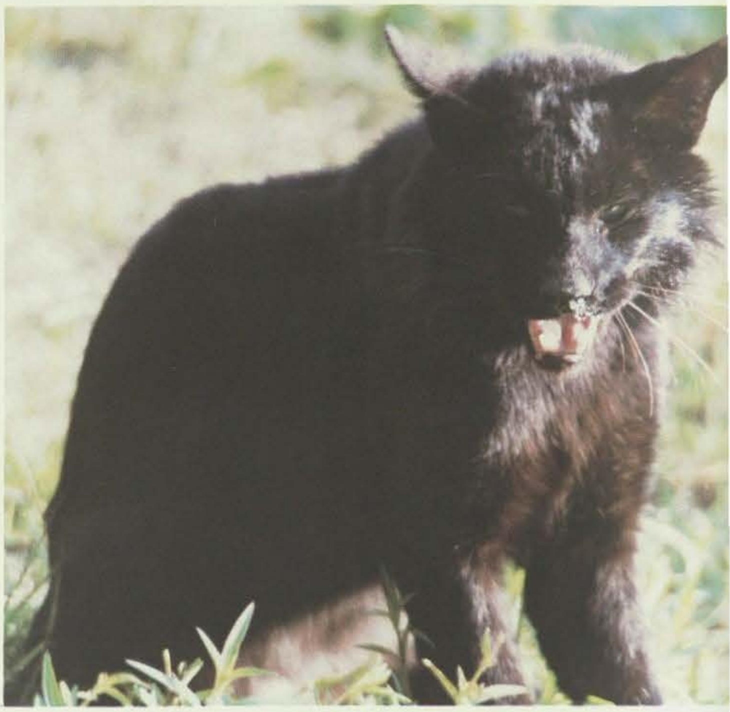
HONORABLE MENTION: *Bobcat by Reed Bowman*

THIRD PLACE (*Tied*): *White-tailed Deer by John Flower*



HONORABLE MENTION: *White-tailed Deer by Mark J. Thomas*

Florida's Melanistic Bobcats



Text and Photographs by Steve Laing

While Florida is known to have many unique wildlife species, bobcats are not generally thought to be one of these special critters...or are they?

The bobcat (*Felis rufus*) is found throughout North America, including most of the contiguous United States, southern Canada and Mexico. The appearance of bobcats varies greatly in different geographic locations throughout its natural range. Different mammalian subspecies often have distinctive fur coloration and markings that usually are reflective of the surrounding environment. Florida's bobcats (*F.r. floridanus*) are generally darker gray with fewer markings than those subspecies in northern and western regions. Among the species' many color variations, however, the existence of a black bobcat is most unusual.

There have been 10 documented cases of black or "melanistic" bobcats since 1939. All have been in southeastern Florida and nowhere else in the animal's extensive range. There were two melanistic bobcats documented in each of Martin, Palm Beach, Broward and Polk counties and one in each of Glades and Dade counties. Of these verified cases, three were live-trapped and sent to zoos, two were killed by trappers, four were killed by vehicle collisions, and the most recent one was live-trapped and released.

There have been 10 documented cases of black or melanistic bobcats since 1939.

Melanism is a genetic mutation that results in a tendency toward black coloration of the animal due to an abundance of melanin, a dark pigment found in the skin and hair of most mammals. Melanistic races or color phases are relatively common in some mammalian species such as red fox (*Vulpes vulpes*), fox and gray squirrels (*Sciurus niger* and *S. carolinensis*) and mink (*Mustela vison*). Melanism in the big cats is extremely rare outside the equatorial rainforest regions. Apparently, very warm and moist climates, which support tropical rainforests, favor the occurrence and expression of this genetic mutation in felids and enhance the survival of melanistic individuals.

Worldwide, wild felids that commonly exhibit melanistic races or black color phases include leopards (*Panthera pardus*) in India, Java and Malaysia; jaguars (*Panthera onca*) in the South American Amazon; Temminck's golden cats

(*Felis temmincki*) in southern Asia; African servals (*Felis serval*) in Kenya; and jaguarundi (*Felis jagouaroundi*) in Central America. Within these examples of melanistic cats, the characteristic or "normal" pelt marking patterns are faintly present in dark brown, yet visible only in bright light upon close examination.

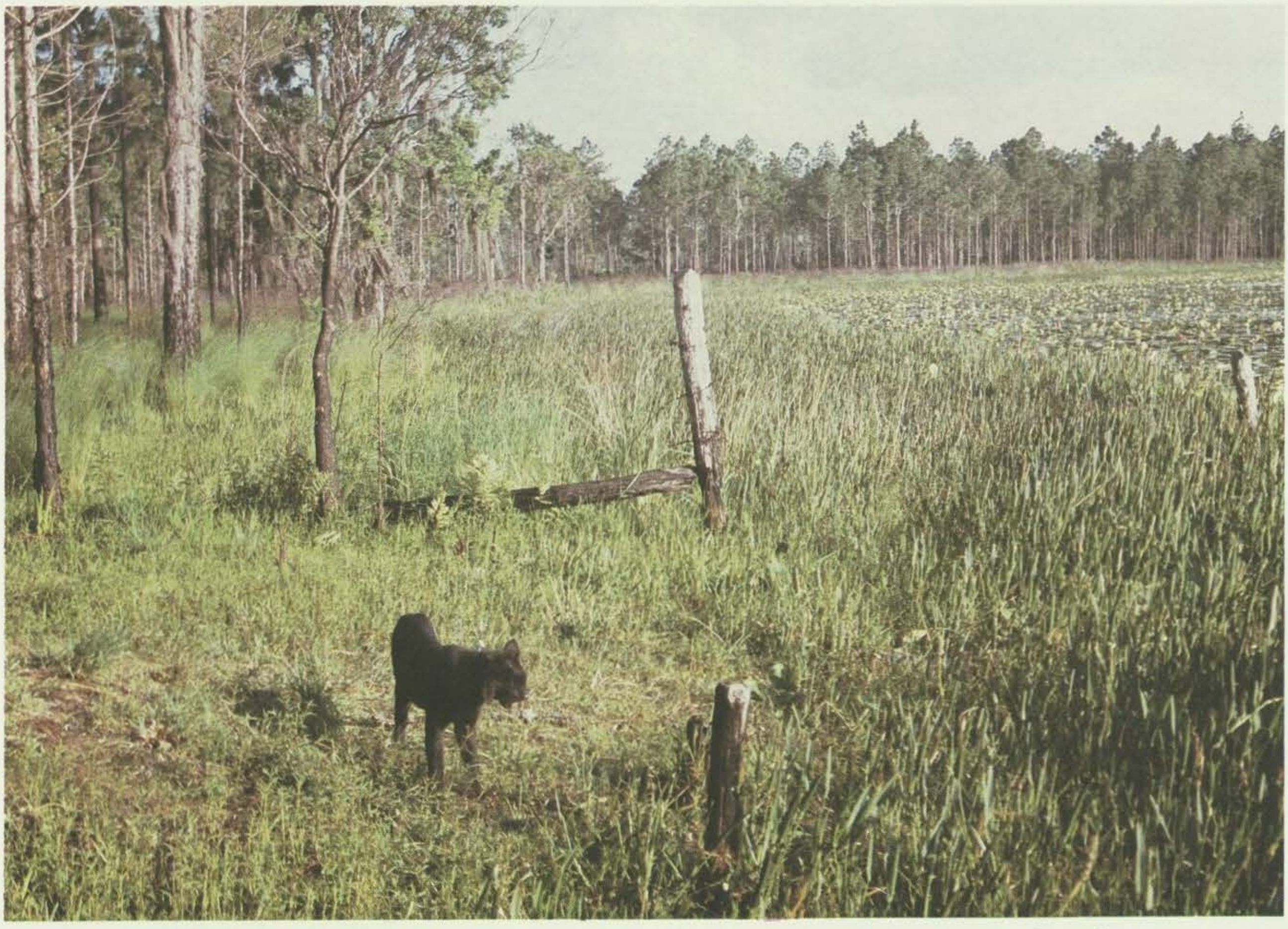
Some of the undocumented reports of "black panthers" in Florida likely can be attributed to sightings of melanistic bobcats. However, several turn out to be otters, dogs and even domestic house cats. While it is possible for melanistic panthers (*Felis concolor*, also known as cougar, puma, and mountain lion) to exist in Florida, there are no documented cases of melanism in this species in the United States.

The physical descriptions of the melanistic bobcats documented in Florida were consistent in that the cats were not entirely black in coloration. Faint banding and spotting on the legs, sides and bellies were evident upon close examination in sufficient light. The color of these cats ranged from black on the head and back, to dark brown (or mahogany) on their sides and bellies. Most of the specimens also had white hairs speckled over their entire bodies and several had a white patch of fur on their groin area.

In April 1990, a melanistic bobcat was live-trapped in Polk County by a resident attempting to capture nuisance raccoons on his property. This bobcat was a large male weighing 25-30 pounds and was identical in appearance to those previously described, although it lacked the small, black ear tufts characteristic of bobcats. Commission biologists inspected the animal and released it back into the wild.

To see a black bird or black snake is an everyday occurrence in Florida. To see a black panther is a case of mistaken identity. But, to see a black bobcat, though chances are remote, is a sight long remembered.

Steve Laing is a Commission wildlife biologist who has a background working with predators and furbearers.



This large male bobcat weighed about 25 pounds and was similar to those previously described in other sightings.

Florida Wetlands

By D. Bruce Means, Ph.D.

With this story on seepage bogs, *FLORIDA WILDLIFE* introduces a series of articles on Florida's major native habitats, or ecosystems. The major habitats of Florida can be grouped roughly into three main categories: aquatic, uplands and wetlands. Aquatic habitats are those that are always in the water column, such as coral reefs, pelagic marine, stream riffles or lake bottom. Upland habitats are most of the dry land environments where we live, such as sand pine scrub forest, beech-magnolia hardwood forest or longleaf pine-wiregrass flatwoods. Wetlands are just what the word implies, *lands* that are *wet*—but not all the time.

Seepage bogs are one type of Florida's wetlands. Mention the terms "lake," "river" or "dry land" and most people have a clear image of what is meant, but few have a complete idea of what is encompassed in the term "wetland." Wetlands are as much a part of Florida as uplands and aquatic habitats, but because of their great diversity and the wide amount of variation in the time water is present in them, Florida residents have been slow to recognize and appreciate these habitats. This is in spite of the fact that wetlands account for nearly one-third (and just a century ago, one-half) of all the acreage in Florida.

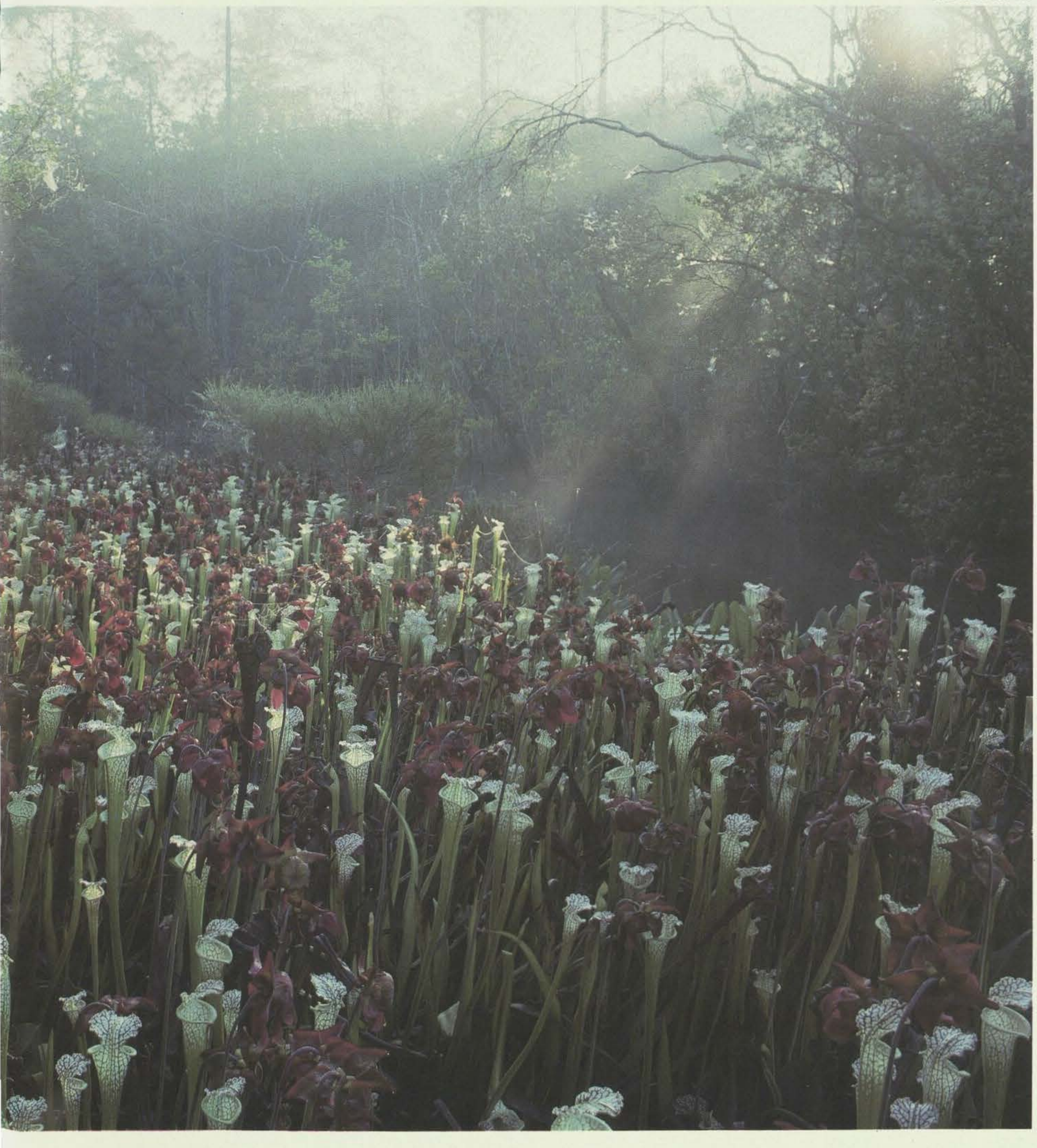
Wetlands are distinctive environments that are transitional between purely terrestrial and purely aquatic. Wetlands are lands where water saturation is the dominant factor determining the nature of the soil and the types of animals and plants living there.

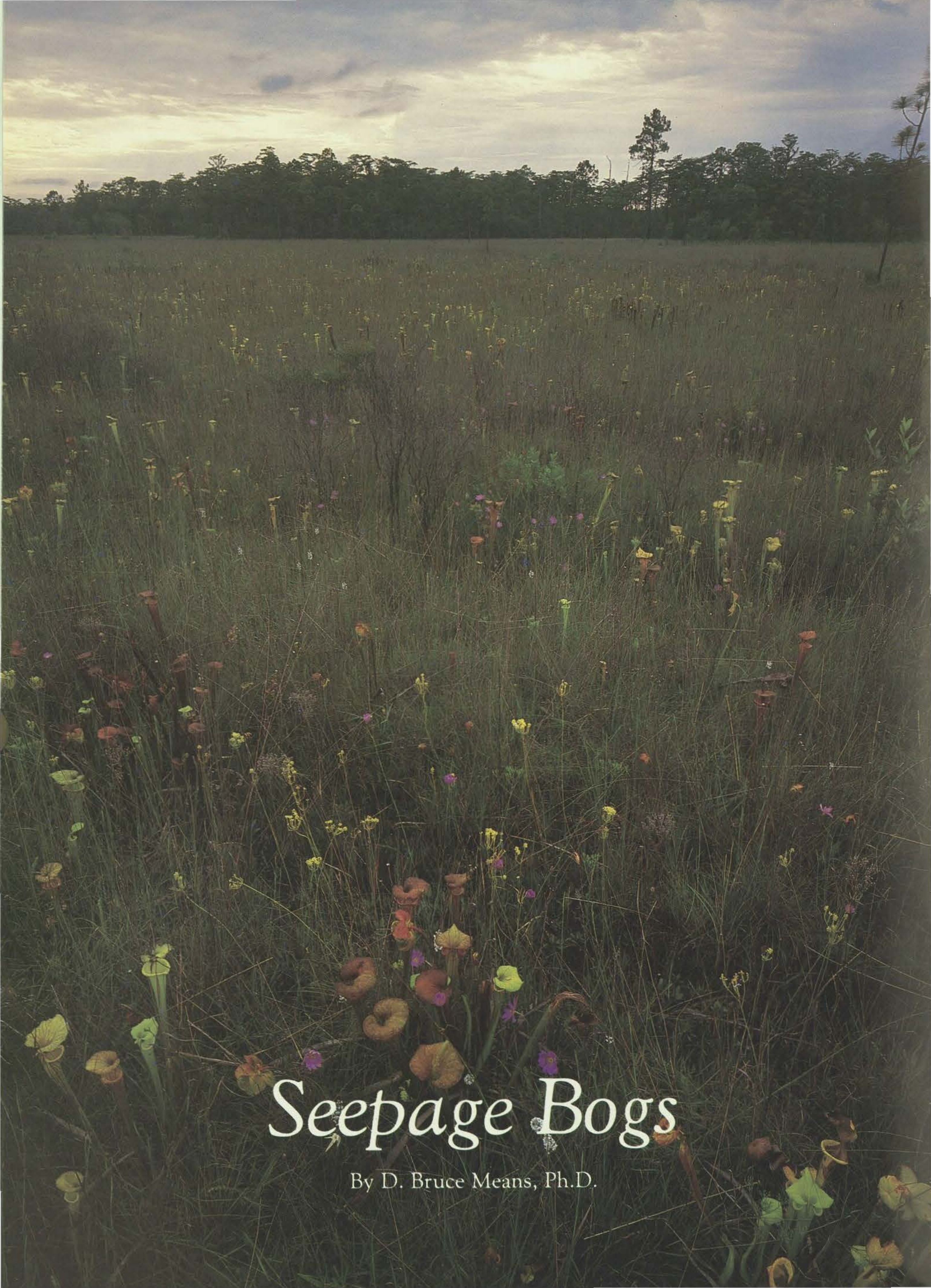
Most people are familiar with swamps, marshes, and bogs...but dripping rock faces, mangrove swamps, beaches, lake margins, temporary ponds, and even roadside ditches are also wetlands. If you are hazy about what wetlands are, be consoled by the fact that only in the past 40 years have scientists really attempted to understand them. However, science has been quick to recognize the exceptional ecological values of wetlands. Far from being the gloomy, miasmatic, quicksand mires of "The Hound of the Baskervilles," or Hollywood's sensational leech-and crocodile-infested marshes through which Bogie tugged the African Queen, wetlands are beautiful, life-giving, water-purifying wonderlands that contain a great deal of the earth's biotic richness.

Wetlands give us most of the world's waterfowl: ducks, geese, herons, egrets, storks, flamingoes and shorebirds. Wetlands provide estuary-enriching nutrients from which we get oysters, scallops, sea trout, redfish, blue crabs, and myriad other edible and marvelous sea creatures. And it is with one type of wetland — seepage bogs —that we inaugurate our Florida habitat series. ▷

Extensive beds of white-top pitcher plant (Sarracenia leucophylla) form on deep peat deposits along Okaloosa and Santa Rosa county steephead streams.

D. BRUCE MEANS





Seepage Bogs

By D. Bruce Means, Ph.D.

D. BRUCE MEANS

If the number of plant species that can be packed into a square meter is any indication of the value of a habitat, Florida's seepage bogs are among the most valuable habitats in the world. And if the number of species of carnivorous plants is a measure of habitat worth, then, Florida's seepage bogs rank among the best anywhere.

In seepage bog habitats of North Carolina's Green Swamp, botanists have counted over 50 species per square meter, North America's present record for plant species richness. There is every reason to believe that Florida's bogs are at least as rich, if not more so, though no formal study has yet measured their species diversity. Among three of the world's four carnivorous plant families, six pitcher plants, 12 bladderworts, six butterworts and five sundews can be found in various combinations in Florida's seepage bogs. So we should all be dismayed by the fact that, by one ecologist's estimate, 97 percent of the Gulf Coast seepage bog habitats have been destroyed by the careless actions of man. And the assault continues.

Left: Pitcher plants in an Apalachicola National Forest savannah.

Above: A pine woods tree frog waits for insects.

◁ JAMES VALENTINE

What are seepage bogs, and what can we do to keep Florida's unique and finest examples from disappearing from the face of the earth? While Florida has many types of wetlands that are created by water seeping from a slope, many of these are technically swamps — wetlands dominated by woody plants, trees and shrubs. Seepage bogs are those areas composed of herbaceous vegetation and open to full sunlight. They are also called "herb bogs," "grass-sedge bogs," "pitcher plant bogs," and large ones, "savannahs."

A bog is a wet place, usually on a gentle slope. Bogs are squishy underfoot because a layer of soaked organic matter has built up on the underlying inorganic substrate, usually sand. The organic layer can vary from mere inches to several feet in depth. It has built up because water seeping out of the ground has prevented total decomposition of all the dead leaves and other plant parts shed during annual plant growth. The seepage comes from small bodies of water that rest underground on top of hardpans of clay, organic material, mineral deposits such as limonite, or rarely, limestone. These perched "surficial" aquifers are most prevalent in sandy soils (because the sand has more spaces in which to sponge up rainwater).

Seepage bogs are found on hillsides where the slope of the terrain drops below the top of the perched water body, allowing water to trickle or to seep out. Don't necessarily expect the slope to be steep, though. While some are pitched at a 10- to 20- degree angle, others are so gentle, falling only a few feet over a couple of hundred yards, that the slope is not visually perceptible.

In Florida, seepage bogs are more common in the Panhandle, west of the Ochlockonee River, where limestone is not near the surface of the ground. Limestone tends to drain water away in subterranean passageways. In 1791 naturalist William Bartram recorded how common and extensive seepage bogs were along the Gulf Coast. From his writings and those of Roland Harper in 1918, we get the impression that areas near the coast, from Pensacola, Fla. to Pascagoula, Miss., used to be nearly continuous pitcher plant bogs.

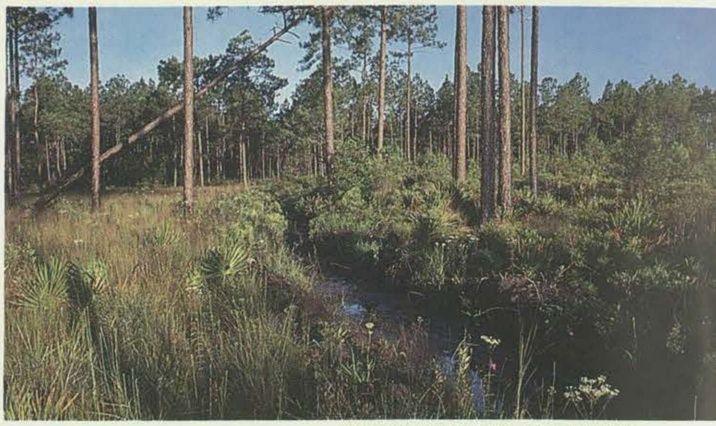
Growing in open sunlight as they do, the herbs of Florida's seepage bogs are true heliophiles — sun lovers. Seepage bogs are the wildflower gardens of the Southeast. Although grasses and grass-like sedges, rushes, pipeworts, yellow-eyed grass, etc. are the dominant plants of herb bogs, forbs (all the flowering plants except grasses) are also abundant. There is always something abloom in seepage bogs.

Early spring (April) is when you see raucous displays of large, exotic pitcher plant flowers, followed closely by the rapid rise of their insect-trapping leaves. The bright yellow heads of trumpet pitcher plants stand on 2-foot-tall stems, soon to be overtopped by the 3-foot-tall yellow-green pitcher leaves. Not to be outdone, in the same seepage bog, a hundred equally striking 2-inch-diameter burgundy flowers stand sentinel alongside delicate, frill-edged white-top pitchers.

At the edge of the shrub zone in wetter conditions, you have to search a little to see the garnet flowers of the parrot pitcher plant, whose parrot-beak-tipped leaves lie on their backs looking up. And inside the wettest shrub bogs lie the baroque leaves of the northern pitcher plant, whose 3-inch-wide lavender flowers are the most spectacular of all.

While the pitcher plants put on their show, deep in the vegetation you can find the sensuously soft yellow, blue or white flowers of the butterworts. The rosette leaves of these carnivorous plants have tiny beads of stick-um dotting the leaf surface — nature's flypaper. If you get jaded by the sheer abundance of the showy carnivorous plants, wait a couple of weeks to view the earth's most resplendent flowers, the orchids. Beginning with grass pink orchids, the seasonal procession brings out delicate rose pogonia and rosebud orchids, then ladies' tresses,

▷



PHOTOGRAPHS BY D. BRUCE MEANS

Above left: A hillside seepage bog.

Above right: Vigorous flowering occurs after a summer fire (left side of plow line). The right side was unburned.

Below: A shrub seepage bog along a steephead stream.

and in the heat of mid-summer, the fringed orchids. Meanwhile, ranks of pipeworts and white-eyed sedge, blue-eyed and yellow-eyed "grasses," and meadow beauties are on parade. By summer's end, after a little respite, the spectacle is far from over. September and October bring on the composites: *Liatris, Helianthus, Solidago, Eupatorium, Coreopsis, Aster, Bigelowia* and more.

One distinctive feature of seepage bogs is high acidity, with pH values ranging 3.5 - 5.0. Since the sand out of which seepage flows is relatively neutral in pH, and the rainwater that feeds the seepage is only slightly acid, the extremely high acidity must come from plants that grow in bogs, or from the chemical breakdown of their partially decomposed tissues. Some students of bogs have claimed that acidity comes from activity of mineral components of the soil. The strange truth is that the origin of the acidity of seepage bogs is still a debated scientific question.

Sand is very poor in nutrients, so seepage bogs pose very special problems for the plants living in them. Plants in this wetland have to overcome nutrient deficiency, high acidity and low oxygen availability resulting from the presence of water. But it is not uncommon during periods of low rainfall for seepage bogs to dry out, in which case bog plants must survive another stress, desiccation. It is fascinating that most of the same families of plants are found in similar habitats around the world. In fact, carnivorous plants are located principally in seepage bogs worldwide. These observations suggest that carnivory in plants is an ancient adaptation. It may have evolved in nutrient-deficient places early in the evolution of angiosperms, before the breaking up of the continents between 65 million and 125 million years ago.

Human actions have caused Florida's seepage bogs to diminish vastly from their original acreage. Most bog loss is the result of drainage associated with the conversion of bogs to cropland, pasture, or intensive pine-tree farming.

In addition, we have paved the way for woody plants to invade herb bogs. Shrubby, fire-sensitive evergreens such as black and swamp titi, dahoon holly, large gallberry, odorless myrtle and fetterbushes normally grow downhill from herb bogs in wetter sites near stream bottoms. By preventing natural fires from keeping them in check, man has allowed these plants to invade upslope into herb bogs and even beyond into longleaf pine forests.

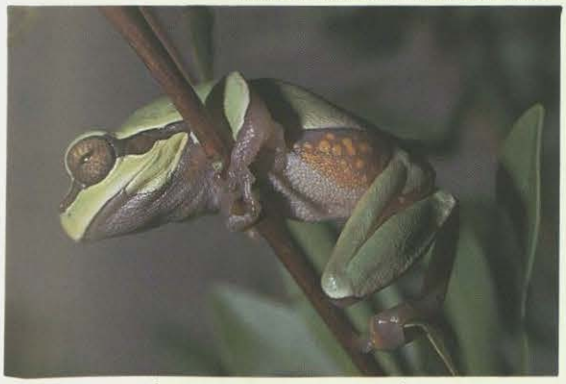
Natural fire cycles have been interrupted by the inadvertent and purposeful actions of mankind for over half a century, so woody growth has had more than half a century to invade seepage bogs and shade out the herbaceous vegetation. Worse than that, woody growth pumps more seepage water back into the air than do herbs. So the presence of seepage water is eliminated, and the hydroperiod of hardwood-encroached seepage bogs is grossly shortened or eliminated altogether. After a bog has been taken over by shrubs, most of the diverse herb community dies because the species are not adapted for dense shade and altered water conditions.

Shrub invasion may affect the local survival of one species of vertebrate that strictly requires seepage water in which to breed. For some unknown reason, tadpoles of the Pine Barrens tree frog require small puddles of the highly acid seepage water. Seepage bogs that are heavily encroached by woody growth have few or no Pine Barrens tree frogs, whereas the most robust populations occur where well-developed herb bogs exist next to shrub bogs, which is the habitat of the adults.

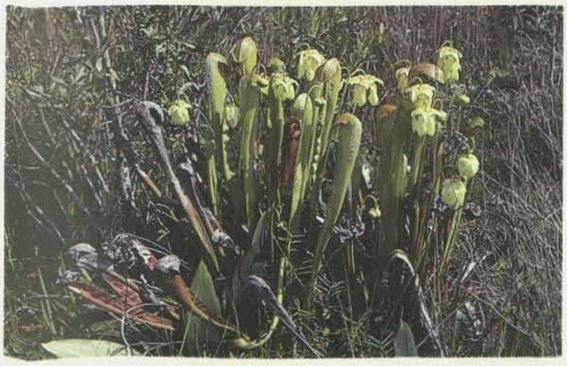
If seepage bogs are so dependent upon fire to keep out woody invaders, and yet if plants in these bogs represent ancient lineages, it would seem that fire has been an important component of herb bog communities throughout the evolutionary history of the plants. In fact, there is evidence from these plants that fire is vitally important to the ecological functioning of herb bogs. The evidence comes from the reproductive response of many of the herbs that live in bogs. When control-burned in autumn, winter and spring, most grasses and many forbs produce flowers no more vigorously than if not burned. However, if burned between May and July, a phenomenal flowering response is triggered that strongly suggests that these plants have all been under selective pressure to flower only during that season. What could the selective advantage possibly be, and why wouldn't a fire at another season cause vigorous flowering?

The selective advantage is easy to see in any bog that has been burned. Dense mats of dead grasses and herbs left over from previous growing seasons normally shade out the ground and make an impossible seed bed for young plants. Any parent plants producing seeds under these conditions are literally "throwing away" their reproductive effort. As difficult as it is for plants to find available minerals and other nutrients in seepage bog soils normally, young seedlings would be faced with no sunlight and excluded from the most important resource of all — energy for growth and maintenance.

PHOTOGRAPHS BY D. BRUCE MEANS



Above: Pine Barrens tree frogs are restricted to seepage bog habitats.



Threatened hooded pitcher plants dominate swamps and seepage bogs east of the Apalachicola River.

Just after a burn, however, conditions are superb for seedling growth. Many nutrients that were tied up in the dead plant parts are flushed into the soil of the bog and are available as fertilizer, and the ground underneath is opened to sunlight. But these conditions are present after a fire at any season.

We really don't know why there is a vigorous flowering response only after a late spring/early summer fire, but we can guess. It takes a long time to put out new leaves, to flower and produce seeds after a fire, so after July there is not enough time left in the growing season, and the probability declines rapidly that a plant can successfully reproduce. Besides, as autumn progresses, plants are nearing their winter dormancy, so seeds produced late in the fall probably wouldn't be able to germinate or have time to grow much if they did germinate.

Natural selection through time may simply have "weeded out" all those plants that flowered following July fires. But this doesn't explain why fires from November through April don't elicit vigorous flowering in the following growing season. The only explanation for this seems to be that natural fires rarely occur during this period in the latitude of southeastern U.S. seepage bogs. Lightning from thundershowers is the source of natural fires. Over the millennia, this activity has been in the summer lightning season, beginning in May.

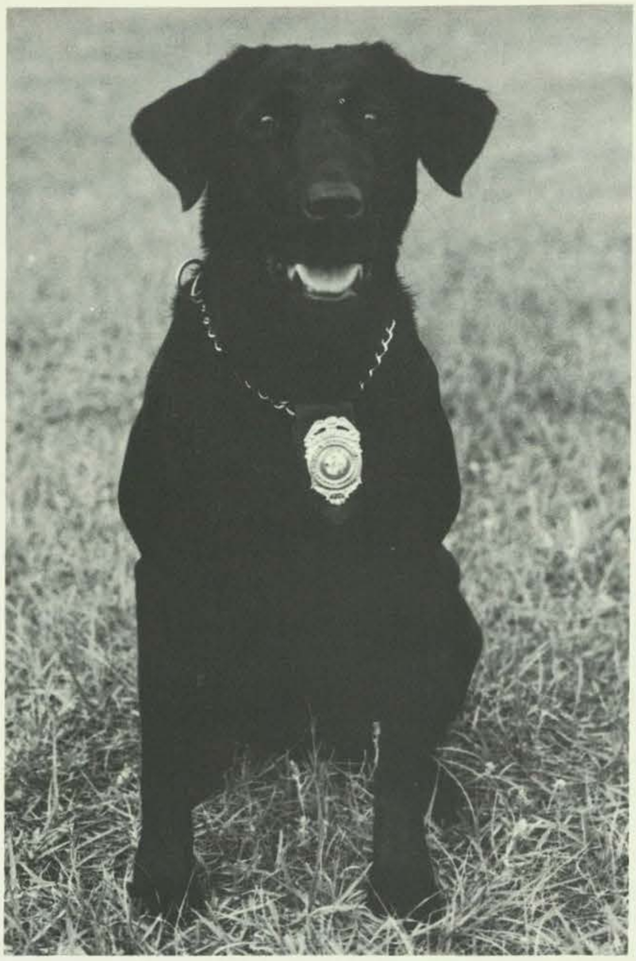
By one botanist's estimate, Panhandle Florida has about 2,200 species of plants. Because more than 100 plant species are packed into a given seepage bog, and the list from all the Panhandle seepage bogs runs to more than 300 species (14 percent of the Panhandle flora), these relatively small acreages contain a proportionately high percentage of Florida's biotic diversity. For this reason they are highly worthy environments to preserve.

We have much to learn yet about seepage bogs, but we must save them first. Because the remaining seepage bogs are small (1-5 acres), they rarely appear on any list for purchase as natural areas. Once protected, there is the problem of how to maintain their ecological integrity. There are many acres of superb bogs on public lands, but neither the Air Force (Eglin A.F.B.), U.S. Forest Service (national forests in Florida), nor the Florida Department of Agriculture (state forests) has developed a specific plan to restore, conserve, and manage them as naturally as possible. If 97 percent of bog habitat has truly been lost in the past century, it's time we placed the remaining few acres among our highest conservation priorities.

***FLORIDA WILDLIFE** continues the series on Florida habitats in the November-December issue with a look at temporary ponds.*

D. Bruce Means, Ph.D., is a professional ecologist with a background in fire ecology, biogeography, biotic diversity, problems facing endangered species, and the biology of amphibians and reptiles. He serves as an adjunct member of the faculties of Florida State University and the University of Florida. He is an adjunct curator of herpetology in the Florida Museum of Natural History and is a research associate of the Smithsonian Institution.

He serves as president and executive director of the Coastal Plains Institute, a nonprofit corporation working to advance scientific and public understanding of the Coastal Plain. Inspired by his extensive research, Dr. Means is currently writing several natural history books.



DEWEY WEAVER

Shasta earned the coveted "Tracking Exceptional" award.

Four-Legged Wildlife Officers

By Mary M. Davis

At first glance, Shasta and Sonny look like ordinary Labrador retrievers, but these canines don't live the ordinary dog's life. Both dogs are Florida Game and Fresh Water Fish Commission K-9 officers, and they spend more time searching for missing persons and illegally taken wildlife than they do searching for steak bones or sticks to fetch.

Shasta and Sonny aren't ordinary K-9 officers, either. According to Inspector Randy Hopkins, chief of field operations and investigations for the Commission, the use of trained dogs by wildlife agencies is a new approach in wildlife law enforcement. In fact, Sonny and Shasta are the only K-9 wildlife law enforcement officers in the southeastern United States.

"We initiated the K-9 program in July of 1989 to determine how trained dogs might help in wildlife law enforcement," Hopkins said. "K-9s have proved to be effective in other types of law enforcement, such as drug interdiction, so it seemed logical for us to test their effectiveness at detecting game and finding missing persons."

Wildlife officers Chip Leavine and Mike Fischer are Sonny's and Shasta's trainers/handlers. They are eager to share proof that, indeed, both dogs are very effective at what they do.

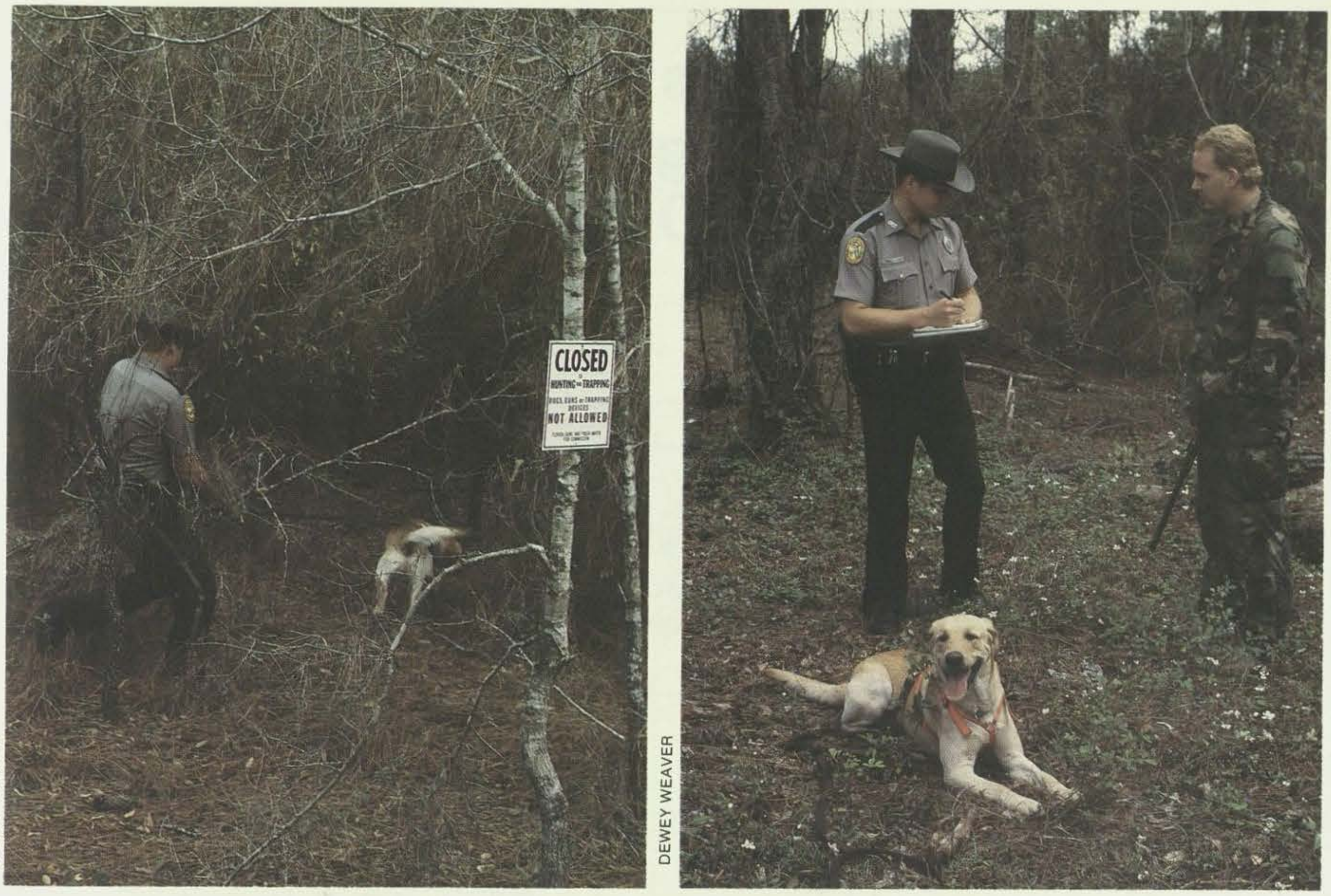
"For example, a central Florida wildlife officer approached several men he suspected of hunting deer at night with a gun and light," Leavine said. "He had heard a shot fired on a dim road late at night. Several officers came to help him search the area for a wounded deer, but they couldn't find anything. The K-9 team, on the other hand, needed only three minutes to locate the deer. As a result, the Commission was able to arrest and convict these men for illegal hunting activity."

Fischer added, "A vehicle loaded with hunting equipment was located in the Citrus Wildlife Management Area when it was closed to hunting. We sent in a K-9 to track the trespassers, and he found them. We were able to make a good case only because we could link the men to the vehicle.

Leavine said that even the threat of using specially trained dogs encourages some violators to 'fess up.

"During the last week of archery season in the Ocala National Forest, two subjects were spotted coming out of the forest's Juniper Refuge. They denied that they had been hunting," he said. "But when officers said they would call for the K-9 unit and that the dogs could find their equipment within minutes, they admitted to hunting in a closed area and led the officers to their hidden poaching gear."

Shasta and Sonny were selected for the pilot program from 23 dogs offered for donation by the public. Shasta, a female black Labrador retriever, was a gift to the Commis-



DEWEY WEAVER

DEWEY WEAVER

The K-9 officers spend more time searching for missing persons and illegally taken wildlife than they do searching for steak bones or sticks to fetch.

sion from the Mitch Palmer family of Lakeland. Sonny, a male blond Labrador retriever, was donated by the John Jefcoat family of Gulf Breeze.

"Our first step in establishing the program was selecting the best breed of dog for the job," Hopkins said. "We chose retrievers because they have a strong desire to work, are easily motivated, have a good nose and are versatile."

Hopkins added that it was important that the dogs selected not be aggressive or intimidating, since Commission K-9s would not be trained in any form of aggression.

"We wanted dogs that could be touched and petted without fear, by both adults and children. These dogs assist wildlife officers in public relations and awareness as well as enforcement duties," he said.

Shasta and Sonny have been trained in wildlife detection and in tracking/search and rescue. A daily log of their training is kept to establish credibility in court, if needed. The dogs can track over multiple terrains, ignoring cross trails and other distractions. They are trained to alert wildlife officers to evidence they may locate along the way. Sonny and Shasta have been acclimated to automobiles, planes and boats, so they can be transported in any Commission vehicle.

The K-9s currently are being trained in water searches. The Commission plans to use K-9s to search for drowning victims. When trained, the dogs will locate scent produced by a drowning victim and indicate where the body is submerged. Hopkins anticipates that the dogs will save many man-hours in water search and rescue.

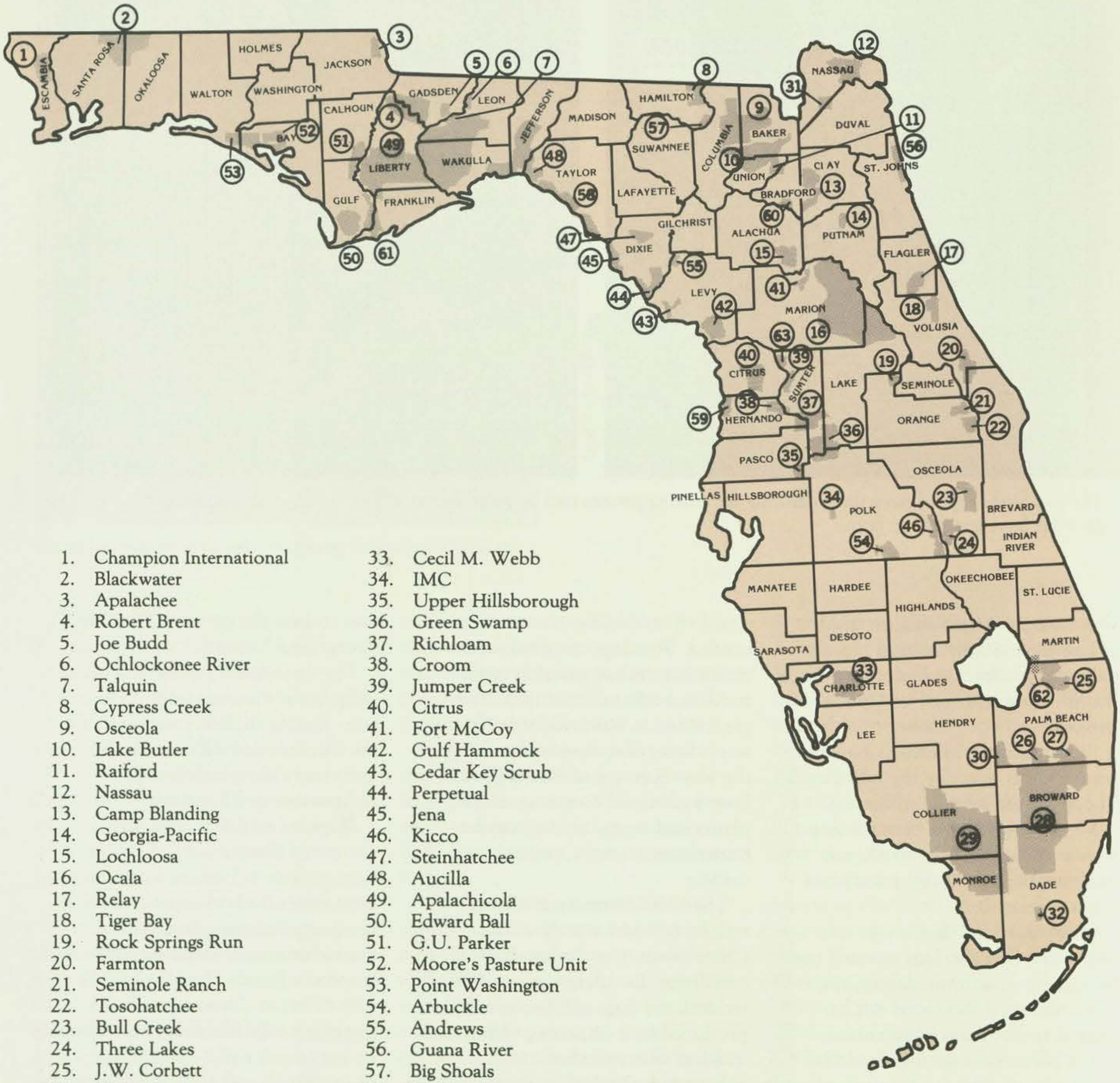
The Labs and their handlers received certification at the U.S. Police Canine Association trials held in Punta Gorda recently. Shasta achieved special distinction as one of only four dogs in the southeast ever to earn the coveted "Tracking Exceptional" award.

The dogs usually work individually but sometimes team up for a case. During its first year of service, the Commission's K-9 unit participated in 150 operations with a success rate of 75 percent.

Hopkins said that, with the success of Shasta and Sonny, the Commission is looking for suitable dogs with which to expand the K-9 program. Citizens who wish to donate retrievers should contact Inspector Randy Hopkins, (904) 488-6254, at Commission headquarters in Tallahassee. Dogs should be between 1 and 3 years of age, physically fit and possess a frantic desire to retrieve. No aggressive dogs will be considered. Dogs offered for donation will be screened individually.

Mary M. Davis is an information specialist in the Commission's Tallahassee office.

Florida's Public Wildlife Management Areas 1990-91



1. Champion International
2. Blackwater
3. Apalachee
4. Robert Brent
5. Joe Budd
6. Ochlockonee River
7. Talquin
8. Cypress Creek
9. Osceola
10. Lake Butler
11. Raiford
12. Nassau
13. Camp Blanding
14. Georgia-Pacific
15. Lochloosa
16. Ocala
17. Relay
18. Tiger Bay
19. Rock Springs Run
20. Farmton
21. Seminole Ranch
22. Tosohatchee
23. Bull Creek
24. Three Lakes
25. J.W. Corbett
26. Holey Land
27. Browns Farm
28. Everglades
29. Big Cypress
30. Rotenberger
31. Cary
32. East Everglades W.E.A.
33. Cecil M. Webb
34. IMC
35. Upper Hillsborough
36. Green Swamp
37. Richloam
38. Croom
39. Jumper Creek
40. Citrus
41. Fort McCoy
42. Gulf Hammock
43. Cedar Key Scrub
44. Perpetual
45. Jena
46. Kicco
47. Steinhatchee
48. Aucilla
49. Apalachicola
50. Edward Ball
51. G.U. Parker
52. Moore's Pasture Unit
53. Point Washington
54. Arbuckle
55. Andrews
56. Guana River
57. Big Shoals
58. Big Bend
59. Chassahowitzka
60. Santa Fe Swamp W.E.A.
61. Apalachicola River W.E.A.
62. Dupuis W.E.A.
63. Half Moon

NOTE: Do not use these numbers for quota hunt choices

Quota hunt applications and hunt maps and regulations for specific wildlife management areas may be obtained from the Commission's regional offices or from county tax collectors and their subagents.

	ARCHERY SEASON	MUZZLELOADING GUN SEASON	MODERN GUN SEASON	GENERAL GUN SEASON	ARCHERY/MUZZLELOADING GUN SEASON	SMALL GAME SEASON	SPRING TURKEY SEASON	FALL TURKEY HUNTING ALLOWED	HOG HUNTING ALLOWED	HOG DOGS ALLOWED	DEER DOGS ALLOWED	STILL HUNT OR DESIGNATED STILL HUNT AREA	CENTER FIRE RIFLES ALLOWED	CAMPING ALLOWED
ANDREWS	XS	XS		XSY		X	XT		X			X	X	
APALACHEE	X	X		XR								X		X
APALACHICOLA	X	X		XR	X	X	X	X	X	X	X		X	X
APALACHICOLA RIVER W.E.A.	X	X		X	X	X	X	X	X	X	X		X	X
ARBUCKLE	XS	XS							X			X		X
AUCILLA	X			XR		X	X		X		X	X	X	
BIG BEND	X	XS		XR		X	X		X	X	X	X	X	
BIG CYPRESS	X	XS		XR		X	X	X	X	X	X	X	X	X
BIG SHOALS	XS	XS		XS		X	XT	X	X			X	X	
BLACKWATER	X	X		XR	XS	X	X				X	X	X	X
BROWNS FARM	X	X		XR					X			X	X	X
BULL CREEK	XS	XS		XR		X	X		X			X	X	X
CAMP BLANDING	XS	XS		XRY			XT	X	X		X	X	X	
CARY	XS	XS							X			X		
CECIL M. WEBB	XS			XR		X			X			X	X	X
CEDAR KEY SCRUB	XS	XS		XS					X			X	X	
CHAMPION INTERNATIONAL	X			XR	X	X	XT					X	X	
CHASSAHOWITZKA	X	X		X					X	X	X	X	X	
CITRUS	XR	XS	XS			X						X	X	X
CROOM				XR		X						X	X	X
CYPRESS CREEK	X	X		XR			X		X		X	X	X	
DUPUIS W.E.A.	XS	XS		XS			XT		X			X	X	
EDWARD BALL	X			XR	X		X				X	X	X	
EAST EVERGLADES W.E.A.	X	X		X		X			X	X	X		X	
EVERGLADES	X	X		XV					X	X	X		X	X
FARMTON	X	XS		XR				X	X	X	X	X		X
FT. McCOY	X	X		XR		X	X		X			X	X	X
G.U. PARKER				XR	X							X	X	
GEORGIA-PACIFIC	X			XR			X		X			X		
GREEN SWAMP	X			XR		X	X		X			X	X	X
GUANA RIVER	XS	XS		XS		X			X			X	X	
GULF HAMMOCK	X			XR			X		X	X	X		X	X
HALF MOON	XS	XS		XS		X	XT		X			X	X	
HOLEY LAND	X	X		XV					X	X	X		X	X
I M C	WATERFOWL AREA													
J.W. CORBETT	X	X		XR		X	X		X	X	X	X	X	X
JENA				XR		X	X		X		X		X	
JOE BUDD	XS				XS	X	X	X				X		X
JUMPER CREEK	X	XS		XR		X	X		X			X	X	
KICCO							XT							X
LAKE BUTLER				XR		X	X		X		X	X	X	
LOCHLOOSA	X	X		XR			X		X		X	X	X	
MOORE'S PASTURE	X	X		XR	X		X		X			X	X	
NASSAU	X	X		XR		X	X		X			X	X	X
OCALA	X	XS		XR		X			X	X	X	X	X	X
OCHLOCKONEE RIVER	X				X	X	X	X				X		
OSCEOLA	X	X		XR		X	X		X	X	X	X	X	X
PERPETUAL	X			XR			X		X		X	X	X	X
POINT WASHINGTON	X	X		XR	X	X	X		X		X	X	X	
RAIFORD	X	X			X		X	X	X			X		
RELAY	X	X		XR			X		X		X			X
RICHLOAM	X			XR			XT		X		X		X	X
ROBERT BRENT	X	X		XR	X	X	X	X	X		X	X	X	
ROCK SPRINGS RUN	XS	XS	XS			X						X	X	
ROTENBERGER	X	XW		XWV					X	X	X		X	X
SANTA FE W.E.A.	X	X			X		X		X			X		
SEMINOLE RANCH	XS	XS	XS			X	XT		X			X		
STEINHATCHEE	X			XR		X	X		X		X		X	X
TALQUIN	X			X		X	X					X	X	
THREE LAKES	XS	XS		XRS		X	XT		X			X	X	X
TIGER BAY	X	X		XR					X			X	X	
TOSOHATCHEE	XS	XS	XS				XT		X			X	X	
UPPER HILLSBOROUGH	XS	XS				X	X		X			X		X

GENERAL GUN SEASON: Any legal weapon including bows, crossbows, muzzle-loading guns and modern firearms unless otherwise prohibited by individual area regulations.

MODERN GUN SEASON: Centerfire shotguns and centerfire rifles only unless otherwise prohibited by individual area regulations. Bows, crossbows and muzzle-loading guns prohibited

X = Yes
BLANK = No
S = Special Quota Hunt Permit Required for all or Portion of Season ; AVAILABLE JUNE 1
R = Regular Quota Hunt Permit Required for all or Portion of Season ; AVAILABLE JUNE 1
T = Spring Turkey Quota Permit Required ; AVAILABLE DEC. 26
W = Walk Hunt Permit Required ; AVAILABLE JUNE 25
V = Vehicle Quota Permit Required ; AVAILABLE JUNE 25
Y = Youth Hunt Quota Permit Required; AVAILABLE JUNE 25

1990-91
HUNTING SEASONS

Florida is divided into three zones for the 1990-91 hunting seasons: Northwest Zone, Central Zone and South Zone. Season dates are as follows:

SEASON	NORTHWEST ZONE DATES
Dog Training	October 6-25
Archery	October 13—November 11
Muzzleloading Gun	November 16-18
Antlered Deer and Wild Hog	November 22-25 and December 8—February 13
Antlerless Deer	December 15-16
Fall Turkey (Gobblers or Bearded Turkeys only)	November 22-25 and December 8—January 13
Quail and Squirrel	November 10—March 3
Spring Turkey	March 16—April 21
Special Post-Season Archery/Muzzleloading Gun	February 14-24
Bear	No open season for bear on private lands in the Northwest Zone. Refer to Apalachicola Wildlife Management Area hunt map for bear season information.

SEASON	CENTRAL ZONE DATES
Dog Training	October 6-25
Archery	September 22—October 21
Muzzleloading Gun	October 26-28
Antlered Deer and Wild Hog	November 10—January 20
Antlerless Deer	November 17-18
Fall Turkey	November 10—January 6
Quail and Squirrel	November 10—March 3
Spring Turkey	March 16—April 21
Bear	November 24—January 20 in Baker and Columbia counties only.

SEASON	SOUTH ZONE DATES
Dog Training	October 6-25
Archery	September 8—October 7
Muzzleloading Gun	October 12-14
Antlered Deer and Wild Hog	October 27—January 6
Antlerless Deer	November 3-4
Fall Turkey	November 10—January 6
Quail and Squirrel	November 10—March 3
Spring Turkey	March 16—April 21.
Bear	No open season in the South Zone.

1990-91 Florida License And Stamp Requirements As Of October 1, 1990

HUNTING LICENSE AND STAMP TYPES AND COSTS*	REQUIRED FOR:
Resident Florida Sportsman's License $66.00	This optional license series allows the holder to hunt or fish statewide and includes the equivalent of the regular *Hunting License, Freshwater Fishing License, Wildlife Management Area, Archery, Muzzleloading Gun, Florida Waterfowl, Florida Turkey* and *Bear* stamps. It does not include the *Federal Duck Stamp*. Trapping or any commercial privileges are not allowed with this license.
Resident Annual Statewide Hunting License $11.00; Nonresident $150.00; Alabama Resident License $100.00	Required to take or attempt to take game or furbearing animals. For other privileges, special stamps may be required in addition to this stamp.
Nonresident 10-Day Hunting License $25.00 Not available to Georgia Residents Nonresident 10-Day Hunting License for Georgia Residents $121.00	Required to take or attempt to take game or furbearing animals. For other privileges, special stamps may be required in addition to this stamp.
Wildlife Management Area Stamp $25.00	Required—in addition to a *Hunting License*—to take or attempt to take game on a Type I wildlife management area.
Archery Stamp $5.00	Required—in addition to a *Hunting License*—to participate in any special archery or archery/muzzleloading gun season.
Muzzleloading Gun Stamp $5.00	Required—in addition to a *Hunting License*—to participate in any special muzzleloading gun or archery/muzzleloading gun season.
Florida Turkey Stamp $5.00	Required—in addition to a *Hunting License*—to take or attempt to take wild turkey.
Florida Waterfowl Stamp $3.00	Required—in addition to a *Hunting License*—to take or attempt to take waterfowl. A *Federal Duck Stamp* is also required.
Migratory Bird Hunting and Conservation Stamp (*Federal Duck Stamp*) Resident or Nonresident $12.50 at U.S. Postal Service offices and some federal wildlife refuges	Required—in addition to a *Hunting License* and a *Florida Waterfowl Stamp*—to take or attempt to take waterfowl. This stamp also allows entry into wildlife refuges where an entry fee is charged.
Bear Stamp	If you hunt bear on the Apalachicola or Osceola wildlife management areas, you must have a bear stamp for each area. The stamp costs $10.00 but is free for *Sportsman's License* holders. Refer to individual hunt maps for more information. Not required for hunting bear on private lands in Baker and Columbia counties.

Freshwater Fishing License Types and Costs*

Resident Combination Hunting/Fishing License	$22.00
Resident 12-Month Fishing License	$12.00
Nonresident Annual Fishing License	$30.00
Nonresident 7-Day Fishing License	$15.00

***Costs do not include issuance fees of up to $1.50.**

Note: saltwater fishing licenses are administered by the Department of Natural Resources.

Certain persons are exempt from license and stamp requirements. Consult the 1990-91 Florida hunting and fishing regulations summaries for details of these exemptions. Or, check with a regional Commission office (listed on page 48) or contact your local tax collector or subagent where licenses are sold.

It's The Law

By Inspector Kyle Hill

LEGAL DOVE HUNTING

Question: I have a friend who was cited last year for illegal dove hunting. How can I stay legal on a dove field?

Answer: There are a number of safeguards a wise sportsman should take to avoid problems while dove hunting. Laws are not complex, but some Southern traditions have led to situations that can violate state/federal migratory bird regulations. The two most common violations are "baiting" and "pooling" doves.

1. **Baiting:** While baiting game animals such as deer is not illegal, the use of bait in hunting migratory game birds such as doves and ducks is forbidden. Baiting is defined as placing, exposing, depositing, distributing or scattering shelled, shucked or unshucked corn, wheat or other grain, salt or other feed so as to constitute a lure or attraction to migratory game birds over the areas where hunters are attempting to take them. A "baited area" means any area where such an attraction exists. Such areas remain illegal for hunting purposes for 10 days following complete removal of all bait.

The exception to the baiting rule includes those areas where corn or grain has been distributed as a result of a "bona-fide" agricultural operation. For example, it is acceptable to combine or otherwise harvest a field of corn, but it would not be legal to "sweeten it" with scratch or other grain.

Each year, dove hunters are cited because they hunt a field that has been sweetened by "golden inducer" and they claim no knowledge of the bait. So before hunting a field, a wise sportsman will walk across the field, looking carefully for signs of scattered scratch feed or commercial wild bird seed mix. Also, it helps if you know the landowner and ask him before you go into the field if it has been "sweetened." If the landowner hesitates or hedges on his answer, avoid the field.

2. **Pooling:** This term refers to the mixing of limits. Picture this scene: You have harvested your limit of 12 doves and placed them in a cooler with your buddy's limit. A wildlife officer approaches and wants to examine your bag. You are in possession of 24 birds. When he leaves, you are in possession of a citation for "over the limit," and he is in possession of the 24 doves! The officer has no way of knowing that the extra 12 birds belong to your buddy because they are not tagged. Nor can he take your friend's word for it. Federal law specifies that "no person shall put or leave any migratory birds at any place (other than his personal abode) or in the custody of another person...unless such birds have a tag attached, signed by the hunter, stating his address, total number of birds and the date such birds were killed." You must keep your birds separate if you want to remain legal.

By observing these safeguards, by carefully counting the birds in your bag and checking to ensure that your gun is properly plugged to a limit of three shells, you can be assured that you will have an outstanding sporting experience in your dove field.

LEONARD LEE RUE III

Hunter Education

By Lt. Byron I. Stalvey

TICKS AND THE OUTDOORSMAN

If you spend any time outdoors in Florida, dealing with bugs becomes a way of life. One bug that has been attracting more attention lately is the tick. This is primarily because of the role ticks play in transmitting disease to people. By taking time to learn about this potential problem, we can reduce the chance that we might contract a tick-transmitted disease.

The tick-transmitted disease that is attracting the most attention lately is Lyme disease, which takes its name from where it was first documented, Old Lyme, Conn. Lyme disease now has been verified in 43 states, with most cases in the northeastern states.

In humans Lyme disease has a variety of symptoms. Doctors divide the symptoms into three stages. In the first stage, an enlarging red rash occurs that may fade in the center as it expands away from the tick bite. About 60 to 80 percent of infected individuals exhibit this rash. Some people exhibit flu-like symptoms such as headaches, aching joints and muscles, fatigue and low fever. Stage one symptoms may occur from several days to weeks after a tick bite.

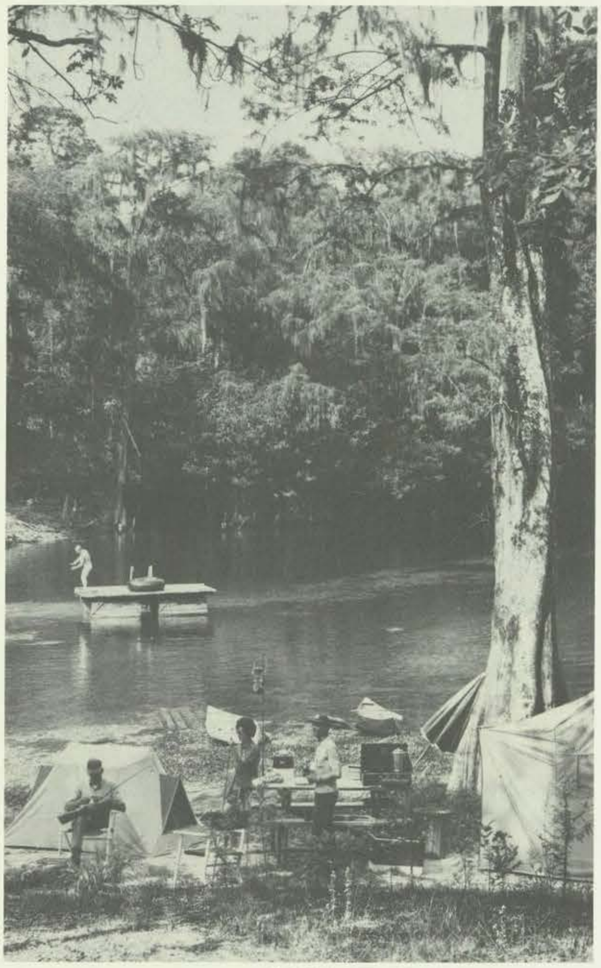
The second stage of the disease can be characterized by symptoms such as a stiff neck, headaches, insomnia and inability to concentrate. Other symptoms in this stage may include dizziness, weakness and irregular heartbeat.

Stage three is the most advanced stage and may occur months to years after the tick bite. This stage is characterized by arthritis which often involves swelling and pain of the knee, wrist and shoulder. Facial palsy, memory loss, meningitis or other neurological disorders may occur also.

If you develop symptoms of Lyme disease and have been bitten by or exposed to ticks, consult a physician as soon as possible. The sooner antibiotic treatment is begun after the onset of the disease, the faster the disease can be cured.

The best way to avoid contracting Lyme disease is to minimize your contact with ticks. If you are in areas with high tick populations, wear light colored clothing. This makes ticks easier to spot and remove before they bite. It's also a good idea to use insect repellents. Be sure to spray your shoes and socks.

When walking in tick-infested areas, tuck pants legs into boot tops and seal with masking or duct tape to help keep ticks out. Periodically check yourself and your pets for ticks during outdoor activities and after undressing upon returning home. Because ticks usually must be attached for at least 24 hours before Lyme disease organisms are transferred, you can minimize your chances of being infected by immediately removing ticks. Not all ticks carry the disease.

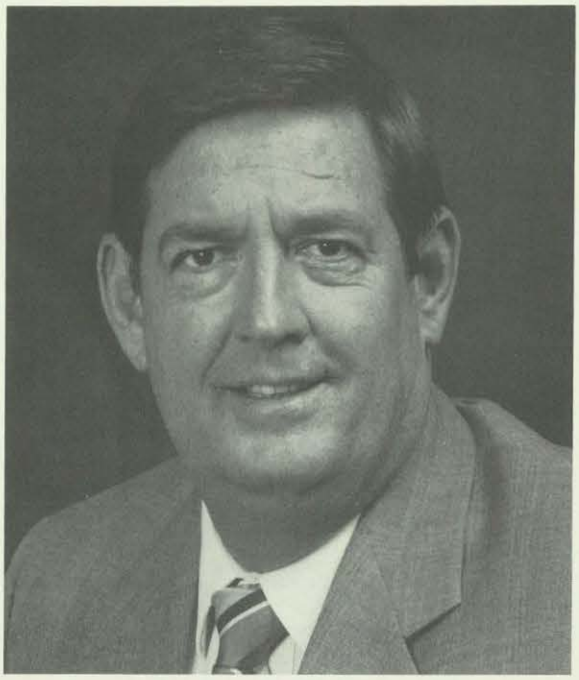

FLORIDA DEPARTMENT OF COMMERCE

If a tick should bite and attach itself to you, remove it with a pair of tweezers, grasping the tick as close to the skin as possible, gently applying pressure to remove the insect. Apply an antiseptic to the bitten area after cleaning. Consult your physician as soon as possible if a rash or other symptoms of Lyme disease occur.

For additional information on ticks and Lyme disease, consult the hunter education officer at your nearest Florida Game and Fresh Water Fish Commission office.

Conservation Update

Compiled by Andrea Blount & Scott Ball



WILLIAM A. GREER

Hilliard Assumes Commission Post

Joe M. Hilliard was appointed to the Florida Game and Fresh Water Fish Commission post vacated by Dr. C. Tom Rainey.

Gov. Martinez appointed Hilliard, a 47-year-old Clewiston farmer and rancher, to serve a five-year term on the five-member Commission. Hilliard assumed the position in February.

Hilliard feels it's especially important that the Commission take a leadership role in encouraging environmental and developmental interests to work hand-in-hand. He believes in striking a balance between those who believe we should "touch nothing" and those who want to "tame everything."

"I'll make a goal of strengthening the bond between Florida landowners and environmentalists," he said. Hilliard is an avid hunter and fisherman.

Hilliard, who was born and raised on his family's ranch in Hendry County, has transformed a modest ranch into a huge enterprise that employs 250. The new commissioner said that for half a century he has been able to make a living by using resources without destroying them.

Joseph G. Spicola Jr., of Tampa, recently was named to succeed Commissioner Thomas Hires, who resigned effective June 1.

Hefner Bunny Endangered

The Florida Keys marsh rabbit, whose scientific name bears reference to *Playboy* magazine founder Hugh Hefner, has been placed on the endangered species list.

Only about 200 of the dark-brown, marsh-dwelling rabbits are known to exist, confined to a few islands in the Florida Keys. It is the only rabbit among more than 1,000 species on the federal endangered species list facing extinction.

The Florida Keys marsh rabbit was given its scientific name, *Sylvilagus palustris hefneri*, after research funded by Hefner proved the rabbit to be unique. It lives in dry salt marsh areas, freshwater wetlands and some pine woodlands. It is a smaller version of the marsh rabbit commonly found in the Southeast.

It and five other endangered species are found only in the Florida Keys.

Sept. 22, 1990

National Hunting and Fishing Day

President George Bush will join an estimated 60 million Americans in celebrating the 19th annual National Hunting and Fishing Day, Saturday Sept. 22.

"During the past half-century, sportsmen have contributed over $12 billion to conservation programs through license fees and self-imposed excise taxes," Bush said in an official statement.

Actor Robert Urich will serve as this year's Honorary Chairman of National Hunting and Fishing Day. Urich, a graduate of Florida State University and an avid sportsman, has previously endorsed the Commission's Wildlife Alert program by appearing in a television public service announcement.

For information on how you can participate in the 19th observance of National Hunting and Fishing Day, write: NHF Day, 555 Danbury Road, Wilton, CT 06897-2217.

Florida Beach Cleanup Day

Sept. 22 also marks a significant day for those who care about Florida's beaches. It's Florida's day to participate in the Center for Marine Conservation's (CMC) "National Beach Cleanup Calendar."

CMC sponsors September beach cleanup efforts in 27 states and Mexico. Last year more than 65,000 people took part in cleanup events along North America's coasts. The goal this year is 100,000 participants.

For information on cleanup locations contact: Heidi Lovett, Center for Marine Conservation, Bayfront Tower, 1 Beach Drive SE, Suite 304, St. Petersburg, FL 33701, (813) 895-2188.

Greenhouse Effect Could Lead Vampire Bats Back To Florida

Perhaps you're aware of some of the potential effects of our diminishing ozone layer: global warming melting the polar ice caps, lifting ocean levels and flooding low-lying areas. Did you know that it also could result in the return of vampire bats to Florida? For that matter did you know that vampire bats ever lived here?

According to Gary Morgan, bat fossil expert at the Florida Museum of Natural History on the University of Florida campus, the blood-sucking bats disappeared from Florida about 100,000 years ago when temperatures cooled. He said the bats still live in Central and South America.

"If our average winter temperatures increased by just a couple of degrees, vampire bats could probably do just fine in Florida," Morgan said.

In South America, the bats prey on cattle by "taking a little bite out of the cow's ankle and drinking the blood," Morgan said. "They don't bleed the animal dry, but over time can really hurt the cow's productivity."

Contrary to Hollywood myth, they don't attack and kill people. Still, a bat could enter an open window attempting to feed on human blood, potentially spreading rabies, Morgan said.

Although it's still too cold for them to migrate over land to Florida, the bats could survive in south Florida if they were brought in from Central America, he said.

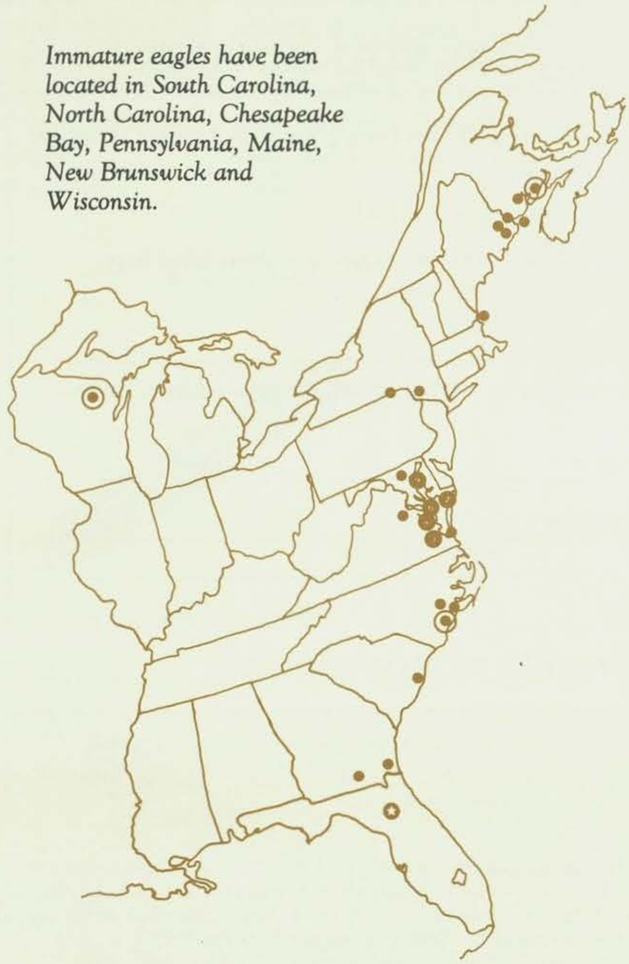
And you thought the marine toad was a problem.

Watch For Those Wandering Eagles

Bald eagles fledged from Florida nests begin returning in September through November. Sightings of marked birds will help determine migration routes and summering areas outside of Florida and habitat use and movement within the state.

The yellow wrap-around wing markers have a one- or two-digit white number on a green or red shape, which is either a circle, a square or a triangle. Eagles are also banded with USFWS bands on the right leg. About one-third of these marked birds carry backpack-style radio transmitters with a three-year life expectancy.

For more information, read "The Wandering Eagles," on pages 19-21 of this issue.



Immature eagles have been located in South Carolina, North Carolina, Chesapeake Bay, Pennsylvania, Maine, New Brunswick and Wisconsin.

REPORT WILDLIFE LAW VIOLATORS AND POLLUTERS

Wildlife Alert

CALL TOLL FREE

Panama City: 1-800-342-1676
Lake City: 1-800-342-8105
Lakeland 1-800-282-8002
Ocala: 1-800-342-9620
West Palm Beach: 1-800-432-2046

FLORIDA GAME & FRESH WATER FISH COMMISSION REGIONAL OFFICES

Northwest Region
6938 Hwy. 2321
Panama City, FL 32409-9338
Telephone: (904) 265-3676

Northeast Region
Route 7, Box 440
Lake City, FL 32055
Telephone: (904) 758-0525

Central Region
1239 S.W. 10th Street
Ocala, FL 32674
Telephone: (904) 732-1225

South Region
3900 Drane Field Road
Lakeland, FL 33811
Telephone: (813) 644-9269

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West Palm Beach, FL 33415
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Floridana

Given the images of the American bald eagle that confront us often in our daily lives, you'd think that all good Americans surely would know a bald eagle when they see one. And I would agree with you — sometimes. We should recognize that the large dark bird with white tail and white head perching conspicuously on a dead tree limb is unmistakably a bald eagle. It is also easy to recognize when we see it soaring on huge, flat, paddle-shaped wings. Perhaps we might mistake the adult bald eagle for the more common osprey, but only if we failed to see the osprey's all-white body, dark streak over the eye or dark tail.

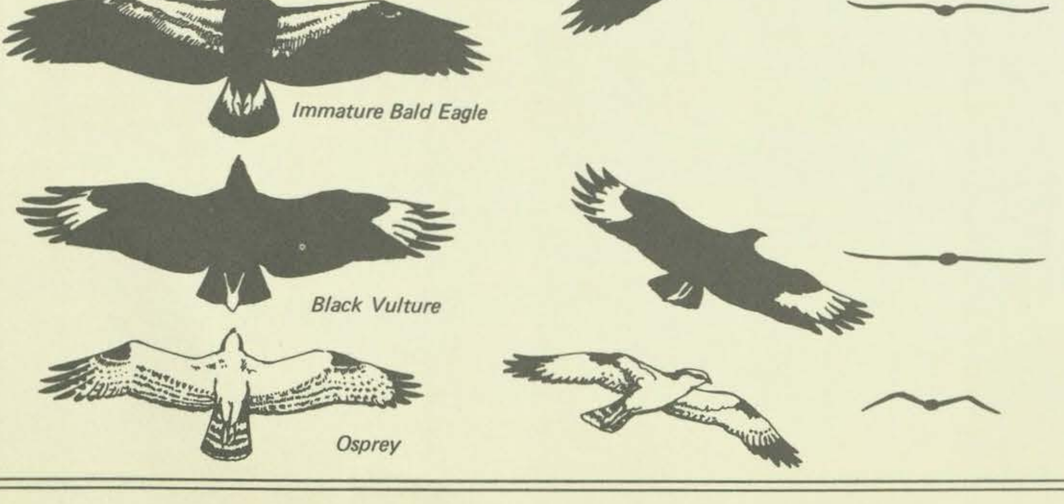
But it is not until the eagle is 4 years old that it acquires the regal white crown and train that so readily distinguish this large raptor from all other birds. Although the eagle matures slowly, the keen observer can perceive specific changes in plumage to estimate the eagle's age. This gradual change in plumage causes confusion even among bird watchers, but with practice young bald eagles can be identified readily, especially when they are soaring overhead. Look for white patches where the wings meet the body and diagonal white lines on the underwings.

During the bald eagle's first year of life, its head is uniformly dark brown. Its back and the leading edge of the wings are tawny brown, contrasting with the dark flight feathers. The breast is dark and may contrast with a pale or tawny belly. Some young eagles may have whitish wash or streaking on their underparts or flight feathers. The following year, young bald eagles gain a white upside-down triangle, streaked with dark, on the upper back, and a dark bib on the upper breast that contrasts with the white belly. The presence of this white belly (streaked with darker feathers) indicates that the eagle is neither young enough to have been born last year, nor old enough to breed.

When bald eagles are about 3 years old, their plumage patterns become very confusing and are quite variable. Many acquire a dark eye-line, giving them the appearance of an osprey, and the head and tail gradually become white. While the white diagonal line on the underwing fades, the white spot where the wings join the body remains. By the fourth year, typical adult dress is acquired with no noticeable change during the rest of life.

So the next time you see a huge hawk that may be an eagle but just doesn't quite look right — take a closer look.

— Doug Runde, Ph.D.



Wildlife at the turn of every page.